GAS JOURNAL

LIGHT ♦ HEAT ♦ POWER ♦ BYE-PRODUCTS

[Founded in 1849 as the "Journal of Gas Lighting."]

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VOL. CLXX., No. 3231.] WEDNESDAY, APRIL 15, 1925. [77TH YEAR.

EDITORIAL NOTES.

The Coming Institution Meeting.

THE prospects for the Annual Meeting of the Institution of Gas Engineers, from June 9 to 12, are of a conspicuously attractive character. There may be good reliance upon the President, Mr. J. Ferguson Bell, M.Inst.C.E., to make the week technically profitable and otherwise enjoyable to the members and all visitors. Of the latter, there is expectation that we shall have the felicity of welcoming several from abroad. The mornings and afternoons of both Tuesday and Wednesday and the morning of Thursday will be devoted to the consideration of technical and business matters. But, dealing first with the lighter side of the programme for the week, there will be on Tuesday evening a reception and dance at the Connaught Rooms at the invitation of the President and Mrs. Bell; and after the morning sitting on Thursday there will be relaxation for everyone during the remainder of the week. On Thursday afternoon those who are in search of scientific and technical interest will have a choice of alternative visits. They may explore the almost boundless activities and the marvels of the equipment of the National Physical Laboratories at Teddington; they may go and investigate the plant under construction at the Fulham Works of the Gas Light and Coke Company; or the thorough character of the work constantly proceeding in, and the fine equipment of, the Chemical and Physical Laboratories and Burner Department of the South Metropolitan Gas Company will be open to inspection. This will be a magnetic feature of the afternoon's engagements. To both the Teddington and the Old Kent Road visits, ladies are invited, and at both places they may be sure of receiving a very cordial welcome. On Wednesday and Thursday evenings, there is confidence in saying that Wembley will draw numerous visitors from the gas men and their ladies assembled in London.

A glorious programme of interest and enjoyment has been arranged by the President for Friday. The only thing over which he has no control is that unruly element the weather; but we shall all pray that Friday above all days of the week will in this respect be of a propitious character. A special non-stop saloon train will early in the morning leave St. Pancras for Derby—the scene of the President's daily professional life. Not only will the Litchurch and Cavendish Street Gas-Works, the Gas Offices, and the Showrooms be open for inspection, but the Locomotive, Carriage, and Wagon Works of the L.M. & S. Railway will be on view; and the ladies—and they only—are invited to visit the Royal Crown Derby Porcelain Works. We feel sure that such an opportunity of inspecting the processes and products of this world-famed place will not be missed by them. At lunch, the visitors will be the guests of the Chairman and Directors of the Derby Gas Light and Coke Company, who are proud of the position to which their General Manager and Chief Engineer has attained in the professional and administrative work of the gas industry; and they will be equally proud of his large following whom they will have the happiness of welcoming. This does not finish the pleasures of the day, for in the afternoon there is to be a motor coach drive to the celebrated Haddon Hall. The details of all these engagements were given in our issue for April 1, p. 59.

Regarding the meetings, honour is to be done to that prominent technician and administrator in the industry, Dr. Charles Carpenter, C.B.E., by the presentation to him of the much coveted and prized Birmingham Medal. The technical work which will engage the members is of a high order, and appropriate to these progressive times for the industry. There will be the President's Address, which is bound to be far-reaching in thought regarding current problems, of which he has a notorious aptitude for keeping abreast. Important items in the programme will be the reports of the Educational Advisory Committee, the Gas Investigation Committee, the Wrought-Iron Tubing Committee, the Joint Refractory Materials Research Committee, the International Commission on Illumination, and the Gas Research Fellowship. As to the papers, these are not numerous; there are only five, but they will—the names of the authors warrant us in saying—be of a quality which will give scope for excellent discussion regarding matters upon which we all require to know more and more, or to which closer and more serious attention should be directed. There will be from the members a rousing welcome for the President of the Société Technique de l'Industrie du Gaz en France (M. L. Rolland d'Estape) when on Tuesday he submits his paper on the "Tankless Gasholder at the Etablissements Arbel, Douai, France." The subject is one which has very live interest among gas engineers in this country. It is well known that a number of these tankless holders, of small and large capacity, are in existence on the Continent. But about them there is information British gas engineers would like to have. Among the questions that may be asked will be: Are they going to save capital expenditure in foundations, tanks, and iron or steel work by adopting the rigid form of holder in preference to the tank column-guided or spiral-guided forms? To what extent and in what ways are such holders likely to affect the cost of maintenance? If, on balance, this type of holder design (given equal capacities) does not save money, does it offer advantages superior in character and in the aggregate which would justify preference in their favour? There will be many inquiries—some critical; but we have no doubt that those engineers who have made a study of these holders will be able to satisfy their interrogators. Then Mr. W. M. Carr will present a paper on the "Selection, Design, and Construction of New Carbonizing Plant at Stretford." The subject is one which will give latitude for discussion. The members are again to have the pleasure of the presence of Prof. C. V. Boys, F.R.S. (one of the Metropolitan Gas Referees), who will submit a paper on "Developments in Gas Calorimetry," and not a few members will then hope to hear when they may expect that the new recording gas calorimeter will be prescribed by the Referees for adoption under the Gas Regulation Act. Another subject which demands from gas men earnest consideration is that of "Town Gas for Motive Power;" and this question will be submitted for consideration by Sir Dugald Clerk, K.B.E., F.R.S., who is pre-eminently qualified to infuse into the minds of gas men the desire for stronger activity in defending and expanding the position of the industry in this regard. Finally, there will be a paper by Mr. George Evetts, M.Inst.C.E., on the "Economics of Gas Production on the Thermal Basis." The mere mention of the

name of the author of the paper is sufficient assurance that what he presents will be a thorough investigation of the matter in hand. We heartily congratulate the President and Council of the Institution upon the technical programme and the attendant arrangements for the forthcoming meeting.

Cost of Inspection and Maintenance.

Scotland has taken a good part in the lead for the adoption of an "all-in" policy in respect of the inspection, adjustment, and maintenance of gas-consuming appliances, charging only for the material used. We are strongly convinced that the protagonists in this matter, whatever their geographical quarter, are right, and that they are doing a genuine service to the industry by pegging-away on all possible occasions at this really vital matter—especially those who practise to the full what they preach, and so can speak from experience. At three or four meetings of the North British Association of Gas Managers, the question has been under consideration, and is being kept to the front as a policy essential to the industry. Those who are the strongest advocates are those who have not only intimate knowledge of the old conditions of allowing the ways and means of utilizing gas to take care of themselves, as the indifference and ignorance of consumers permit, but have had experience of the advantage of supervision. We are confident that the relating of these experiences will do more to influence those who are still reluctant to adopt this policy than all the arguments, though irrefutable, without experience. Both arguments and experiences can be obtained from the valuable papers read by Mr. J. W. Napier, of Alloa, and Mr. George Keillor, of Greenock, which we published last week, and the notable statement by Mr. J. W. M'Lusky, of Glasgow, which we report this week. Of the facts of the question, all three have long experience as the foundation of their advocacy; all three tell us plainly that—proud as we may be of the progress the industry is making—there is in more cases than has even been dreamed of by many responsible gas men a condition of things existing the other side of domestic and industrial meters of which we cannot be proud, and which, with neglect of adjustment and maintenance in other cases, is the worst enemy to the stability of the industry which it has to face in these competitive times.

We do not wish on this occasion to labour the seriousness of the position; what we do wish is that those gas managers who have not yet made survey of the internal conditions in their area of supply, should do so, and then determine their policy, having regard to the keener competition which gas has to meet through electricity undertakings desiring the fuller development of, and greater diversity in, their loads. The gas industry has got to resist this by the best means at disposal; it has at the same time to develop its own load. As to the former, the most effective method is to incorporate in the trading policy an inspection and maintenance scheme, and that is also one of the best roads to the development of business. With the large connection the gas industry already possesses, it is more difficult than formerly to get new customers; but with competition surrounding, and with neglected lighting, heating, and cooking appliances giving indifferent service, it is easy to lose old customers. It is therefore an absolute necessity, in order to obtain increased custom through existing services, that there shall be satisfaction on the part of the consumers with their present appliances. That is so obvious that it is almost superfluous to write it; and yet apparently its significance is not appreciated by some administrators. Mr. Napier, Mr. Keillor, and Mr. M'Lusky, one after the other showed that inspection, adjustment, and maintenance, and the greater personal contact between consumers and competent representatives of their undertakings have brought about a larger demand for gas appliances which should be credited to the inspection and maintenance system—even though it is impossible to make a positive financial assessment to set against the cost of periodical house-to-house visitation to establish and maintain high efficiency. Beyond this there is a material credit in the retention of old customers, who, when once they have borne the cost of effecting a change, do not feel disposed to make a return, although they learn there is not the same economy and efficiency as under the older system when properly treated.

The question of the cost of adopting the policy of inspection, adjustment, and maintenance, is one that has perhaps, through a mistaken idea, caused much halting and deferment in adoption. The gas industry is the debtor to Mr. M'Lusky for the enlightening information he has from time to time furnished as to the financial aspect of the policy. Each time he has spoken in regard to it, the case has been better than on the previous occasion. The secret of this is that, as development of the application of the system proceeds, the cheaper it is per 1000 c.ft. or per therm to carry it on. We are also inclined to think that, as the rough places are made smooth in an area of supply, inspection, regulation, and maintenance become an easier matter; and, moreover, the competence of the men in the work becomes greater. These are in our view factors which operate to bring about a lower cost. It will be remembered that, after the work had started in a trial area in Glasgow, with its ghastly revelations as to what existed, Mr. M'Lusky estimated the cost at 1½d. per 1000 c.ft. After a time, the actual cost was 1¼d. But now with the spread of the system, the elimination of what was bad, and the greater efficiency of the men through experience of the work, the cost has come down to 0·592d. per 1000 c.ft.—constituted of: Labour, 0·375d.; material, 0·084d.; and overhead charges, 0·133d. Per therm, the figures are: Labour, 0·08d.; material, 0·018d.; and overhead charges, 0·028d.—a total of 0·126d. It is estimated that in Glasgow there are 1,250,000 appliances in 213,447 premises; and now 995,038 burners and appliances are being maintained as compared with 410,000 appliances when Mr. M'Lusky reported upon the position last September. The number of appliances has increased by 140 p.ct.; and the expenditure has been reduced as stated from 1¼d. to 0·592d. per 1000 c.ft. There might be a slight increase in the cost in more restricted areas; but there may be good confidence, based on the experience of Glasgow, that the initial costs per 1000 c.ft. or per therm or per appliance will be reduced to a modest figure. The question is, Is the result worth the expenditure? Our reply is positively in the affirmative. What is the cost of the loss of custom and a heavy complaint list in comparison? Does the Glasgow consumer object to paying 0·126d. per therm more to realize a higher efficiency, a lower gas account for an equivalent amount of work, and greater satisfaction? The expenditure pays the consumer, as it certainly does the gas undertaking.

Coking Experts and the Coke Competition.

The question has been put to us whether technical men engaged in coke-oven practice are eligible for participation in the Coke Competition. We may say at once that welcome will be given to contributions from any source which in any way contain suggestions of value in respect of coke to the gas industry; and this applies to the technical men engaged in the coking industry. There are various reasons why they should come in as participants. There is no question from what is seen to-day in respect of the business relations between the coke-oven industry and the gas industry that—gradually it may be, but certainly—the two industries will have to draw together closer and closer. In respect of the question of the co-ordination of the utilization of the fuels of the country, we have the growing transfer of coke-oven gas to suitably situated gas-supply undertakings; and the millions of cubic feet so purchased annually is a largely growing quantity, and this is likely to continue to be so. Also in respect of sulphate of ammonia and benzole, the two industries are co-operatively concerned in propaganda and sales. Thus the tendency is for closer identity between the two industries; and, looking forward, it is easy to conceive that in time they will present a still more united and common front. Furthermore, the difficulties of the coke industry in regard to the demand for metallurgical coke being far short of productive capacity have, through industrial depression during the past few years, been very great; and the prospect is that, with the return of better conditions on the Continent, there may be a further substantial decline

in the requirements of other countries for our furnace coke. Therefore, naturally, the coking industry has been looking round to ascertain in what way it can extend its markets for coke; and it is now well known that there are coke-oven plants which are producing coke suitable for domestic and industrial purposes. Taking all these things into consideration, we could not shut out from the competition the ability and talent which exists in connection with coke production in the related industry. But, in saying this, our friends of that industry will bear in mind that the object of the competition is primarily to encourage improvement in the production, handling, and utilization of domestic coke, though this is not the sole aim.

Publicists and the Coal and Power Problem.

No excuse need be offered for referring to this subject so soon after the Southern Association meeting, because the gas industry (as has been frequently emphasized in these columns) is so deeply concerned in altering, to the advantage of the nation at large, the threatened trend of things. We are sorry to see that so many of our publicists who are influences in shaping public opinion, are, through nescience and misunderstanding, helping to do the shaping in the wrong direction. These publicists require to be educated to see the error of their ways in this particular. Take as an example Mr. G. L. Garvin, whose articles in "The Observer" are always widely read. In the course of a recent outpouring on the subject, he alluded to electricity and oil as being the great solution of our problem. Whittling down what he said, we come to super-power stations and low-temperature carbonization. He predicts that the World Power Conference at Wembley last year taught us many lessons; but we fear that, in the multiplicity of counsels, Mr. Garvin has lost his way. He also credits Mr. Lloyd George with having rendered better service on this subject than any other public man, though he made the incidental error of mixing democratic emotion with a severely technical subject. We feel that Mr. Garvin's view should have a wider application than to Mr. Lloyd George; perhaps it might with excellent validity be applied personally. We agree with him absolutely that, "if we mean to be again a progressive and thriving and confident nation," we must undertake "a technical revolution on a national scale by making a modern use of our basic product coal." But our views distinctly disagree as to the nature of the "technical revolution." Mr. Garvin submits that coal should be converted at super-power stations partly into electric current available for "machine force," transport, heat, and light throughout the country; partly into fuel oils and other valuable derivatives. It would be interesting to know the fundamental data upon which this moulder of public opinion bases his ideas of what should be done.

For our own part, we object to coal being used, especially for producing electricity for general heating, at super-power stations at from only 18 to 20 p.ct. efficiency, the energy being transmitted about the country at heavy cost and loss. These are technical matters that popular writers do not understand, nor can they be expected to do so. "A clean and smokeless civilisation" is not to be obtained through the uneconomical means Mr. Garvin suggests—uneconomical to both the nation and the individual. The gas industry can show a better way; and if Mr. Garvin will only study the economics of the question from all points of view, we are confident he will become a convert to the proposal for an examination of the whole question from all points of observation, and not from the single one which appears to be so popular in the lay mind. The same thing might happen if the Minister of Transport and Minister of Mines would study the problem from other aspects than the one on which they have been steadfastly keeping their eyes, as though there was no possibility of there being any other. The Minister of Mines, states Mr. Garvin, recently described "the new use of coal" as our one ray of hope; and he went on to remark: "I have authority to say that the Government "are going to spare no money, no energy, and no effort "to bring this process to perfection." It is to be hoped in the national interests that they are going to do no such foolish thing. As a nation we cannot afford it. We want economy, and not a blind headlong rush into greater uneconomy.

As to the low-temperature coal carbonization process, it has a lower thermal efficiency than the high-temperature one; and the present state of the markets for the secondary products ought to be a warning to the visionaries that any pre-carbonization of coal by low temperatures would not reduce the generating costs of electricity, but would raise them to a figure which would make the electricity industry rock with anger against those who had, through stupidity and resistance to full inquiry, led it into such a mess. Our advice to publicists such as Mr. Garvin is that they should make certain they have the basic facts, and not accept the hypothetical assurances of any non-technical person who comes along with a superficially plausible tale, or persons interested in particular processes or plants. The same comments apply in major part to a paper read by Mr. Johnstone Wright, the Belfast Corporation Electrical Engineer, at a recent meeting of the local Association of Engineers. In the course of this, he stated that of the strictly technical problems of the future, so far as electricity production is concerned, the first is a more complete realization of the value of fuel. The change in the last few years in the value of fuel—not only measured in terms of currency, but in terms of human effort—has turned upside down all our previous conceptions. Mr. Wright thinks it is probable that the solution lies more in selective low-temperature carbonization with recovery of useful products. But we will give him credit for realizing the speculative side of the proposal; and the effect this would have in causing uncomfortable oscillations in the cost of generating electrical energy. The element of speculation is, in fact, formidable to Mr. Wright; and, in his opinion, might alarm investors and affect the facilities for raising capital. In view of this, he submits that an ideal distillation scheme is wanted—one which would enable the user to vary rapidly the classes of bye-products, so as to meet changing markets, and, to ensure success, one that would be financially safe, even if a large part of the products were used for power generation. It is something to find in one quarter a recognition of the element of speculation. Having got so far, Mr. Wright should explore the commercial aspects, and perchance he will find that the whole range of secondary products from coal carbonization has dropped considerably in market value, and that unfortunately simultaneously. In such circumstances, it is impossible to see how even the ideal system that he has adumbrated in his own mind would, through the varying of the products according to the state of the markets, ensure success. There can be no assurance of success. The position is altogether different with the high-temperature process, the gas therms from which have a large constant market at a much lower cost than low-temperature gas or electricity can offer.

It may be charged against us that we are prejudiced in favour of high-temperature carbonization, and, in the interests of the gas industry, of a better co-ordination of the utilization of our national fuel supplies. If there is prejudice, it is born of the knowledge of the economic advantages in comparison with the situations occupied by the various vague and unsubstantiated schemes which have been put forward. No one is asked to accept our statements without the fullest investigation. It is such investigation that the gas industry desires shall be made in the national interests before it is too late. If our publicists desire to take a hand in some really good work, it should be in urging such an inquiry, and not accepting as being of proved soundness and validity such ideas as are confidently put forward by Mr. Garvin, and as pointed to as directive by Mr. Wright. The days have passed for piecemeal treatment of such a highly important matter; the days are here when thoroughness and comprehensiveness should be showered upon the solution of the fuel, power, and heat problem of this country.

Wembley Opening.

The former announcement as to the opening of the British Empire Exhibition has been cancelled. The day is now fixed for Saturday, May 9; and the ceremony will be performed by the King, who will be accompanied by the Queen.

London Gas Price Advances.

As was foreshadowed at the recent annual meetings of the proprietors, the London Gas Companies have had to raise the price of gas. This has been absolutely essential, in view of the serious fall in the values of secondary products, and the higher wage payments. The necessity for an increase of price having arisen, it is good policy not to defer it, in view of the fact that, in the lighter months of the year, the consumers will feel the increase less than they would during the winter season. In the case of the Gas Light and Coke Company, the increase is from 8·6d. to 9·4d. per therm. The South Metropolitan Company have raised their charge from 8d. to 8¾d. per therm. The Commercial Gas Company's price has ascended from 8⅛d. to 9⅛d. The Wandsworth Company have advanced the differential prices ruling in their areas by ⅛d. per therm.

Industrial Rating.

Regarding the rating of industrial establishments, the gas industry will have much sympathy with the views of the Federation of British Industries which were at a recent interview laid before the Minister of Health. The basis of assessment at the present time differs as between area and area; and this is distinctly inequitable from the point of view of competition in different trades. The gradual extension of the assessment basis has also added to the burden of rates borne by industry. The recommendations of the Inter-Departmental Committee appear to propose to establish by Bill the present basis of assessment, with the proviso that only a proportion of process machinery is to be included for valuation purposes. To these recommendations the Federation are strongly opposed; mainly on these grounds: (1) Equity in comparison with other classes of rateable property; (2) equity between industries; and (3) uniformity. The Federation hold that uniformity can only be obtained by accepting the net rental value as the basis of valuation. To assess this rental value, they submit there should be taken into account only land, structure, and first motive power producing plant, and that this rental value should be adjudged taking into account the normal working hours of the particular industry concerned. In view of the great divergencies of practice in different factories for power purposes, the Federation suggest that the power plant should only be taken as far as the control of the first producing plant. Where energy is purchased from an outside source, there should be no assessment of the power plant unless a converter or transformer is used. It is, however, left open as to whether gas-engines should or should not be assessed where gas is purchased from an outside authority. The Federation are of opinion that the policy they recommend would be a distinct incentive to manufacturers to employ the most up-to-date plant, and to make the replacement of out-of-date plant a subject less to be feared than it is at present. This naturally would result in a general improvement of industrial efficiency.

The Factory Bill.

It is understood that the Government have decided that the Factory Bill shall not be deferred to next year, as formerly intended, but shall be introduced as early as possible after Easter. It is said that the measure contains about 140 clauses. Though largely a Consolidating Bill, it incorporates several new proposals, some of which are calculated to arouse considerable controversy.

Co-partnership Bill.

The Co-partnership Bill was recently introduced for second reading in the House of Commons; but there seemed to be little enthusiasm over it. Indeed, after the mover and seconder had spoken, the opponents—Labour-Socialists and an Arch-Communist—fired volleys of platitudes at it, with the result that the measure was talked out.

The Vauxhall Colliery Lesson.

A short time ago we referred to an interesting experiment which is being made by the miners at the Vauxhall Colliery, near Wrexham. It will be remembered that owing to output and costs and lower market values, the owners determined to shut down the pit; but the men are now proving that, if they choose to exert themselves, they can not only earn more money, but can convert a losing concern into a paying one. They entered into an agreement with the owners to work the pit rather than be thrown out of employment. The conditions included a guarantee that the men should bear any loss. To protect themselves, a guarantee fund has been raised by them. Some of the miners at other collieries have subscribed towards the fund; and the men have been encouraged by promises of contributions from other quarters. The fund, however, is purely for protection purposes; and it is hoped it will not be required. So far the men are perfectly contented. They are working full time; but their wages have already increased. Very few coal getters in the district are receiving the minimum wage of 9s. 6d. per day; but the week before last, the wages book of the Vauxhall men showed they were earning from 12s. to 18s. per day. The North Wales Miners' Association appear to be troubled as to the line of action they should adopt towards these members, who have dared to labour in a way which is to their personal advantage, but opposed to the policy of the Union. We can understand the Executive of the latter being disturbed by the proof that is being given as to the ability of the men to work to greater productivity, and so gain an increased rate of pay. The Executive of the Union proposed that the men should be expelled for three months; but they have gone on despite the excommunication threat. There is some uncertainty, too, as to the attitude over the matter of all the miners in the area, some of whom have gone so far, as already said, to subscribe to the guarantee fund. We like the sportsmanlike spirit that this shows; it throws into stronger relief the pernicious policy of the Union. No decision, however, has yet been arrived at as to Union membership of these men who are looking after themselves rather than be slaves to the policy of the obscurant Union rulers.

Synthetic Nitrogen.

In the House of Commons recently, questions have been asked as to the purchase from the Government of the nitrogen "factory" at Billingham by Messrs. Brunner, Mond, & Co., Ltd. The suggestion is that the terms were unduly advantageous to the firm. There is not the slightest foundation for this, judging from a letter from Colonel G. P. Pollitt, a Director of Synthetic Ammonia and Nitrates, Ltd. When taken over, the factory consisted of a number of fields, not drained, and only partially provided with roads and railways. Not a single building other than contractors' temporary huts and sheds for stores had been erected. The general stores on the site, the contractors' plant, the roads and railways, and the contracts entered into by the Government were finally agreed by the representatives of the firm and of the Disposals Board at £495,000. The Company have carried out to the full the wish of the Government that the synthetic nitrogen industry should be established in this country. As a consequence, it is claimed that not only have they largely increased the supply of fertilizers at less than pre-war prices in this country, but they have also rendered it independent of Chilian nitrate as the chief source of our national explosives supplies. It is added that anyone familiar with the precariousness of the position with regard to fixed nitrogen in the last war will realize that this achievement is of the highest national importance.

Poplar Wages Surcharges.

The Poplar Borough Council have had to climb down in connection with their extravagance in the payment of wages; and they are now in a serious dilemma. It will be remembered that the District Auditor made a surcharge of £5000 on members of the Council in respect of wage payments during 1921-22. The matter has been contested in the Courts; and the House of Lords has upheld the surcharge. Now the Council have been brought to their senses, and have resolved to consider the whole question with the view to bringing wages into conformity with the decisions of the Courts. As the same time, an appeal has been made to the Ministry of Health, asking that the surcharges be remitted; the grounds being that the matter has been one of great difficulty, and one which was novel and of vital importance. It is also desired that the costs of the proceedings shall not be made the subject of a surcharge. It is evident, however, that the Council are unrepentant, as they say that, under protest and with great reluctance, they propose to consider the whole question of wages with the view

to conforming with the decision. They plead that they are in a quandary owing to the fact that neither the Court nor the Auditor has stated what wages can be paid. Detailed consideration is therefore required; and they are prepared to promise there shall be no unnecessary delay. It should be easy enough for the Council to ascertain what is paid for similar work by councils who have not been surcharged. Anyway, the Poplar Council have now learned that ratepayers must be protected against the extravagance of partisan councillors.

PERSONAL.

Mr. J. Hood, Chief Technical Assistant to the Shrewsbury Gas Light Company, has been appointed Assistant Engineer and Works Manager to the Cheltenham Gas Light and Coke Company. Last year Mr. Hood was awarded a First-Class Diploma in Gas Engineering under the Education Scheme of the Institution of Gas Engineers; and he has since been elected a full member of the Institution.

Mr. F. Allen, B.Sc., has been appointed Assistant Engineer to the Bedford District Gas Company. Mr. Allen graduated at Leeds University in 1923, since when he has been assisting Mr. F. A. West, of the Newark Gas Company.

Mr. H. Taylor, formerly a member of the staff at the Central Laboratory of the Birmingham Gas Department, has taken up the position of Chief Chemist to the County Borough of Blackburn Gas Department.

Mr. W. G. S. Cranmer, Manager of the Willenhall Gas-Works, has been re-elected a member of the Short Heath Urban District Council.

Mr. Albert Whiteley (the Manager and Secretary of the Kirkburton Gas Light Company, Ltd., near Huddersfield), has been appointed a Director of the Shelley and Shepley Gas Light Company, Ltd., Shelley, near Huddersfield.

The Megiun Vertical Rotary Retort.

Mention is made by "Engineering" of the rotary low-temperature retort of the Megiun A.-G., at Butzbach, which, it is stated, differs from others chiefly in one respect. The retort is externally heated; but the vapours liberated collect in the central portion of the retort, where they are protected against over-heating by a double shell of steel and the coal under carbonization. The retort consists of a vertical drum rotating at a rapid rate within the setting. Inside this drum revolves a second drum, at a slower rate. The two drums are supported on the same vertical shaft. The outer surface of the inner drum is fitted with a helical conveyor fin, and the coal descends on this helix in the annular space between the two drums. Owing to the rapid rotation of the drum, the coal is thrown against this shell, which is exposed to the furnace flames, especially in the upper portion. The lower portion of the furnace is not heated. The inner shell is perforated, and the vapours liberated pass through the perforations into the inner space of the retort, which is much wider than the annular space. From this inner space, the vapours are withdrawn upward. Experiments which have been continued for several years in a small plant show, it is said, that a superior low-temperature tar is produced, fairly free from dust. The further product is a good semi-coke. Experiments have been made with various coals and lignites; and a point of interest is that coal dust and lignites high in earthy constituents, otherwise not amenable to retort treatment, have been carbonized.

Institution of Chemical Engineers.—At a meeting of the Institution to be held in the hall of the Chemical Society, Burlington House, Piccadilly, on Wednesday, April 22, a paper entitled "Continuous Distillation of Petroleum" will be presented by Mr. A. M. O'Brien, F.I.C., M.I.Chem.E. The President of the Institution (Sir Arthur Duckham, K.C.B.) will take the chair at 8 o'clock.

Eastern Counties Gas Managers' Association.—The President (Mr. F. A. West) will receive the members and guests at the gas-works, Barnbygate, Newark, at 11.45 next Wednesday (April 22), on the occasion of the half-yearly meeting; and they will afterwards be entertained at luncheon by the Chairman and Directors of the Newark-on-Trent Gas Company, in the Clinton Arms Hotel, Market Place, at 1.30. At 2.45 the business meeting will take place in the hotel; the agenda including the President's Address and a paper by Mr. C. B. Donkin, associate member, on "Gas for Industry." In the evening there will be the annual dinner; and for the following day a drive has been arranged from Newark to the Chesterfield Works of Messrs. Bryan Donkin & Co., Ltd., where special furnaces to be described in the paper already referred to will be shown. The members will be the guests of the firm at luncheon.

ELECTRICITY SUPPLY MEMORANDA.

In the work of the Electrical Development Association, Mr. R. Hardie, of the Glasgow Corporation Electricity Department, has become quite a favourite person since electric cookers were let on hire in that city. In the "Memoranda" last week we referred to his paper at the last (for the session) Salesmanship Conference in London. Since then he has been in Leeds lecturing at a local Salesmanship Conference. His subject on this occasion was "Electric Cooking Problems"—the same old problems, in a new dress of words. In his prefatory observations, the lecturer emphasized the fact that the questions of installation costs, hiring charges, and (most important) running costs, weigh very heavily with consumers in coming to a decision in regard to electric cooking. As to the hire charge, he stated that for the first year it was £1, and 10s. per annum afterwards; and this sum includes special wiring, which costs £2 10s., together with a kettle and kettle-board, which cost £1 10s. This brings the total capital outlay to approximately £16. It seems to us that, the capital outlay amounting to £16, the hiring charges will not liquidate the sum before the expiration of 31 years, to say nothing of interest and depreciation. There may be some explanation; but, as we read the reports of the lecture, the user pays £1 the first year, leaving £15 to be discharged at the rate of 10s. per annum thereafter. If this is so, then one can fairly say that the apparatus will be worn out or obsolete long before the capital has been wiped-out by the hire rates mentioned by Mr. Hardie. The Department, it appears, have been in a bit of a quandary regarding the correct hire charge to make. In the initial stages they imposed a charge of £2 per annum; and it is acknowledged that they had many grumbles in respect of this because in Glasgow gas cookers are installed free. Hence the reduction. Mr. Hardie also admits that, in spite of the attractive tariff, they have occasionally received complaints of excessive running costs, which, of course, he alleges are due to extravagant and improper use.

Cooker Hire Charges.

Satisfactory, and Yet Not So.

The lecturer proceeded to state with confidence that the modern electric cooker is satisfactory in the hands of the average careful operator, owing to the improvements which have been effected during the past three or four years. But as we read on, it is found that the hotplate, which is the largest absorber of electrical energy, is still in an unsatisfactory and inefficient state. How can there be complete satisfaction with this defect in a vital part? Mr. Hardie holds that the oven and the grill are both good features—in fact, like a good honest electrical salesman, he says that these features are superior to any competitive apparatus. But as to the hotplate, he says: Surely there is sufficient ability in the electrical ranks to provide one which will embody improvements suggested from time to time by experts! He goes further and suggests that the "E.D.A.," or the "I.M.E.A.," or the "B.E.A.M.A." might offer a substantial money prize to the producer of a cooker boiling-plate which would at once be speedy and indestructible; one condition being that the minimum efficiency shall be 50 to 60 p.ct. For many years the manufacturers of electric cookers have been trying their utmost to secure precisely what Mr. Hardie now advocates a prize should be offered for; and they have not succeeded. Had they done so, the indestructible and highly efficient boiling-plate would now be part of the ordinary electric cooker. There are many physical and other difficulties in this regard—difficulties due not only to the heating medium itself, but to the use to which the boiling-plates are put by householders. It is not an easy matter; and Mr. Hardie knows this quite well, otherwise we are confident that he would make a memorial for himself by producing the thing required. However, this gentleman, as we showed last week, is of a most ungenerous disposition, and cynical where gas is concerned. He seems to be particularly fond of trying to besmirch the gas cooker with all the calumny which prejudice can suggest, which is dangerous. In this particular lecture he says that the gas industry has taken thirty years to produce what it describes as the "perfect" cooker; and it gained its knowledge not only by workshop or laboratory tests, but by experience with apparatus under actual working conditions. In the interim, in spite of the "imperfect" apparatus, it has succeeded in building-up an enormous cooker business. If anything, that statement is (though unintentionally so) against Mr. Hardie himself, in view of the fact that, notwithstanding the "imperfections" of the gas-cooker, the electricity supply industry has not been able to build up an enormous cooking business. The public are evidently the better judges of the relative perfections or imperfections of the two systems of cooking; they certainly know on which side is to be found household economy in respect of money, time, and range of utility. Hence the 5½ million of gas cookers and grillers which are to be found in use in England, Wales, Scotland, and Ireland.

A Heavy Capital Expenditure.

Of course, one great obstacle to the development of the electric cooker is its very high price. Mr. Hardie points out that while a gas cooker costs about £4 the electric cooker costs £12 10s. We would add that the extent of the capabilities of a gas cooker which costs about £4 are a long way ahead of those of an electric cooker which costs £12 10s. It is admitted that it may be reasonably expected that the electric cooker will cost more than a gas cooker, but our Glasgow friend thinks that three times more is too much, and therefore a reduction of price is imperative. An important point is made in this connection. The capital expenditure involved in the hiring-out of electric cookers at such prices as those now ruling would be immense if the business developed in any substantial measure. In our opinion, such capital expenditure will be avoided by the limitations set on demand by the electric cooker itself. In Glasgow, for example, Mr. Hardie states they have at present on hire 1400 cookers which involved a capital expenditure of over £20,000. Our friend appears to have been shocked by what results from multiplying that figure by five, inasmuch as he describes it as "appalling." Multiplied by five, the number of cookers only becomes 7000; but the capital expenditure £100,000! Mr. Hardie thinks that little can be done in cheapening the cost of electric cookers unless a factory is provided and equipped for mass production. He is afraid that at present the majority of firms engaging in this class of output regard it as purely a side line.

Electric Cables and Street Explosions.

In the "Journal" for March 25 (p. 751), paragraphs appeared referring to two street explosions. The first related to an explosion at Notting Hill Gate, which sent into the air six electric light distributing boxes, and damaged about 300 ft. of pavement. The other explosion was at Acton, when four men were injured. The explosion wrecked the bars and blew out the windows of a public house. Regarding the latter uncomfortable incident, Mr. G. L. Jennings, of the Brentford Gas Company, in our issue for April 1, pointed out that this explosion was not in any way connected with the gas supplied by his Company. It was caused by the fusing of a long length of electric cable, which gasified some of the bitumen coating. The gas so generated was the cause of the trouble; coal gas not being in any way concerned. The unpleasantness with gas electrically generated from the bitumen coverings of cables is an old-standing one; and it was a fortunate thing for the gas industry when explosions up North and in the Midlands caused the identification of the real culprit in the matter. Prior to these occurrences, it was always charged to the gas supply that leakage of gas into electric cable culverts was the actual cause of street explosions. But now, as in this Acton case and in the Notting Hill Gate one, it is frequently possible definitely to prove that the electric cables themselves are solely responsible for these happenings. In the "Electrical Review," Mr. W. Love, writing on the Notting Hill Gate upheaval, alludes to the common assertion that such incidents are caused by leakage from adjacent gas-mains, and he says that no other cause has hitherto been suggested. Of course, in this he is totally mistaken. However, he advances another theory for some of these explosions. He says he is deliberately of opinion that they are attributable to electrolytic decomposition of water or humidity, and the ignition of the resultant gases by short circuit, &c. To this conclusion he has been led by the fact that such explosions are always extremely violent—a constant characteristic of the inevitably correct proportions of oxygen and hydrogen produced by electrolytic decomposition. On the other hand, an explosion of gas might occur with wide variations in the proportions of gas and air. Anything above or below the critical mixture considerably weakens the explosion which at its best or worst is mild in comparison with the violence of the absolutely correct mixture produced by electrolysis. To know the cause is the first step towards finding the remedy. We hope in the public interests the remedy will be found.

The "E.D.A."

The Electrical Development Association appear to be making somewhat slow progress in increasing the membership. To this opinion we are led by statistics which appear in the annual report of the Council of the "B.E.A.M.A." for last year. As a matter of fact, the net accretion in membership of the Development Association was only from 1166 to 1172 during the year. Of this number, municipal undertakings represent 100, companies 87, manufacturers 244, contractors 741; but some of the concerns have raised the amount of their annual subscription. It is also learned that, in addition to the ordinary revenue of the organization, nearly £25,000 was contributed last year by 264 supply undertakings towards the display organized by the Association at the British Empire Exhibition. The latter figures show that the administrations of a considerable number of supply undertakings refused to dip into their funds to help in the co-operative display at Wembley. We know too that prior to the Exhibition of last year, as well as during its course, there were several hints in the electrical Press regarding the difficulties that the Association had had in raising the sum necessary for making an effective display during the six months.

Local Exhibitions.

In the same report there is a reference to exhibition policy. The managements of electrical undertakings seem to be unanimous in the opinion that the manufacturers of electrical appliances have unlimited resources—financially, and in respect of spare goods. Before the question of exhibiting at Wembley last year was talked about, there had grown up in the electricity industry a large demand on the part of undertakings for local exhibitions, with the view of stimulating the business of their enterprises. These exhibitions were promoted by both municipal and private concerns. They overlapped as to subject, and there was conflict in date—in fact, there was no system of any sort in their organization. Naturally, this created a great deal of perplexity among those firms who would wish to be of assistance in such matters, but who were debarred by the real complexity of conditions from doing what they would otherwise have done. The report before us states that even before Wembley closed its doors last October, this movement had been revived, and had since grown almost to an epidemic. It is said that the taking a hand in such exhibitions by members of the "B.E.A.M.A." is, by a clever system of "snowballing," rendered almost an obligation upon them. But the Council of the Association now feel that the whole position will have to be reviewed. They are wise in this. The appliance manufacturers connected with the gas industry would be equally averse to being assailed in the same manner—amounting almost to persecution. Certainly what is described is an unfair drain upon the resources of the various electrical firms.

April 1.

On this date "Electrical Industries" published a paragraph, "Gas Refused." In the course of it the remark was made: "If we were so inclined, we might call the attention of the 'Memoranda' contributor of the 'Gas Journal' to this awkward bit of news, and ask him to explain it away with his pretty wit; but we do not like to ruffle anybody unduly—so we won't mention it." The writer of "Gossip" in our contemporary need not be afraid of hurting the feelings of the writer of the "Memoranda," and particularly in connection with the matter in hand. It refers to the ventilation of a certain section of the offices of the Glasgow Corporation Gas Department, and to a proposal to instal electric lighting in it. We need not re-enter into this matter, in view of the fact that, on the same date as our contemporary appeared with its invertebrate paragraph, the position of this question was explained in two paragraphs in the "Memoranda" under the headings of "Circulating Falsehood" and the "Present Position." If the writer of "Gossip" will refer to those paragraphs, he will obtain some useful enlightenment.

Gaseous Fuels for Furnace Heating.

In a recent paper before a meeting of the West of Scotland Iron and Steel Institute by Prof. R. V. Wheeler, the author discusses the relative merits of carbon monoxide and hydrogen for furnace heating. Though both have the same calorific value, a carbon-monoxide flame radiates nearly 2½ times as much heat as a hydrogen flame burning the same volume of gas. On this score alone, therefore, a high content of carbon monoxide is preferable to a high content of hydrogen in a producer gas for furnace work. The rates of burning of hydrogen and of carbon monoxide in contact with heated surfaces are widely different. Surface combustion, though it can be usefully promoted in certain circumstances, may prove deleterious in an ordinary furnace, in view of the fact that the production of local high temperatures is harmful to the furnace walls, and materially shortens their life. Hydrogen when mixed with air is far more susceptible than carbon monoxide to the catalytic effect of heated surfaces. For this reason the destruction of brickwork in a steel-melting furnace is more rapid, and the wastage of material in a reheating furnace is greater, when the producer gas used contains a high proportion of hydrogen. With regard to the use of coke-oven gas for furnace heating, the methane and, to a lesser extent, the carbon monoxide stabilize the flame; and the hydrogen and carbon monoxide, by reason of their wide limits of inflammability, ensure the "adaptability" of the gaseous fuel. The chief advantage claimed for coke-oven gas is that the working temperature of the furnace can be increased so that about 25 p.ct. increased output can be obtained; while difficulties encountered in its use are the tendency of the flame to rise to the furnace crown and fuse the brickwork (because of its low density compared with that of producer gas), and the low luminosity of the flame (owing to the freedom of the gas from tarry vapours) which renders difficult observation of the conditions in the furnace. Both difficulties can be overcome by using tar in addition to the gas; and, since the use of coke-oven bye-products in this manner dispenses with gas producers and simplifies the construction of the furnaces, no doubt the practice will spread.

EFFICIENCY IN GAS-WORKS.

A New Point of View.

By "Psychologist."

The word "efficiency," when used in relation to the working of gas undertakings, is usually associated with technical advances, and in general little heed is paid to what may be termed the human side of the question. Large sums of money—quite rightly—are spent annually on purely scientific research, but too little effort is made to increase efficiency by studying the conditions under which the gasworkers do their work. From time to time, of course, improvements are made in working methods in (say) the repair shops of the larger concerns, but these improvements are casual, and are not based on a real appreciation of the existing conditions. It is only by intimate contact with, and careful examination of, the particular work and the particular circumstances that the defects of an existing system can be realized; and the management, who perhaps only spend a few minutes in the shops each day, cannot grasp them. It is impossible for them to discover the means by which working conditions can, in small ways, be so changed as to increase the efficiency and happiness of the worker, and, through this, the output of work per man.

Those Little Things.

What are regarded as the trivialities of life are often, in the mass, of far more importance than the events which appear outstanding; and so it is in work—the minor and so-called unimportant details are in the aggregate of major consequence. The scientific outlook has resulted in amazing progress in every field of the gas industry's activities; and it is suggested—and the suggestion is based on results—that industrial psychology can do much to increase efficiency in other directions in all these fields. In this short article it will suffice to take two examples of the application of psychology to the gas industry—first, in a stove and meter repair shop; secondly, in the selection of suitable workers for the industry.

National Institute of Industrial Psychology.

The work is being carried out by the National Institute of Industrial Psychology. The first thing they do is to send an investigator to the job, so that he may find out exactly what are the physical and mental requirements of the work. No recommendation is made to the management until the investigator has spent at least a month in the particular shop which is under test, and has thus become intimately acquainted with the work and the prevailing conditions. In the meter repair shop of a large gas company, it was found that the handles of the soldering irons were two inches too long—a small point to the management, certainly; but not a triviality to the man who has to use the tools every day of his working life. This defect was rectified, and the results were amazing. Then it was discovered that the workers were much less tired at the end of a day's work if they were provided with wooden footboards which allowed free circulation of air. It was also found that by attention to efficient lagging, the workers were far less affected by the heat from the soldering-iron stoves. In the stove repairing shop similar small changes were effected, or new apparatus introduced. Brushes, tools, devices for lifting, and many other points were examined closely, and improvements were made. These improvements, in themselves small, were, taken together, of first-rate importance; not only did they increase the efficiency and output of the shops, but also, by relieving discomfort and doing away with unnecessary expenditure of energy, made the workers much happier.

Square Pegs for Square Holes.

In any industrial concern it is easy to appreciate the difference in value between an efficient and an inefficient worker. It is not as though the inefficient worker were merely a nuisance to himself; he is a nuisance to everyone around him, and lowers the working rate of his associates. Two or three men who are obviously unfitted for their work can often spread discontent throughout a shop. The object of the National Institute of Industrial Psychology is to assist in the choice of the right type of man for a particular job. First of all the mental and physical requirements of the job are found—in some work, for example, manual dexterity and keen eyesight are demanded. Then apprentices, &c., are chosen who have the necessary qualifications. This selection is much better than the ordinary procedure of examination and interview. Psychological investigations have been carried out in polytechnics in London on tests for the admission of apprentices to the various branches of engineering work; and these are now being applied practically and with success in two large Manchester works. Definite occupations require well-defined qualities in the youth who intends to take up the work. A meter inspector, for example, should have a memory for figures. In the case of a draughtsman, apart from the technique and conventions of drawing, the ability of "seeing into the solid" is essential for this type of worker. The same ability is a necessary factor in the sheet-metal trades. There the men start from the flat to work the metal to the three dimensional. True, they may work to templates, but these should be for testing and correcting in the majority of cases. The work in the main depends on a particular ability of space perception. So one could continue; but sufficient has been said to indicate that increase of efficiency in the gas industry does not depend wholly on technical considerations, and that probably the incorporation of psychology will form the starting point of new advances.

COAL AND CARBONIZATION.

A meeting of the Birmingham and Midland Section of the Society of Chemical Industry was held on Tuesday, March 31, at the University of Birmingham. Prof. G. T. Morgan (Chemistry Department, Birmingham University) presided, and there was a good attendance of chemists and others interested in the chemistry of coal, oils, and other minerals.

Dr. R. Lessing read a paper on "The Inorganic Constituents of Coal." He pointed out that no less than 25 million tons of non-combustible material are annually distributed in Great Britain. Leaving out of consideration the potential value of iron, sulphur, and building materials, which may in the future be recovered from the coal minerals, the inorganic constituents are worse than useless, and involve the nation in a non-productive expenditure of millions of pounds, absorbing, for example, 10 to 15 p.ct. of the mineral traffic of the country.

Dr. Lessing proceeded to classify the mineral constituents according to their origin from plant material, decomposed rock, saline deposits, before, during, and after coal formation, and their products of interaction. He referred to the work of Dr. Marie C. Stopes on the constitution of coal, and to his own work, as well as that of Sinnatt and others, on the mineral matter in coal. He showed from detailed analyses that clarain and vitrain contain only original plant ash, and that durain is a mixture of small plant entities such as spores and cuticles. He showed that the largest proportion of ash was derived from the roof, floor, and dirt-bands of coal seams, and that the inherent ash of pure coal did not exceed 3 p.ct.

The lecturer then described and demonstrated experimentally his method of separating coal quantitatively into its ingredients by his combined elutriation and float-and-sink method. He pointed out that this method afforded a means of coal classification on a rational basis. He insisted that the ash content should be allowed for in any method of classification. Dr. Lessing proceeded to demonstrate the significance of his experimental results for practical coal problems. He pointed out that the elucidation of the morphological structure and chemical constitution of coal was a first condition for success in solving these problems.

He described his method of mining coal chemically with the aid of sulphur dioxide in substitution for explosives, and referred to the trials carried out in this country and America which had already demonstrated that this reagent could be used underground with absolute safety and without discomfort to the workers. He then showed the importance of the inorganic constituents in the preparation of coal for the market, particularly in coal washing, and foreshadowed an extension of the scope of coal refining beyond the reduction of the ash content to the commercial separation of grades for definite purposes—such as coking, gas-making, smokeless-fuel producing, boiler firing, and domestic use. He referred to the difficulties of commercial sampling, due to the uneven distribution of mineral matter in coal, both as regards percentage and chemical composition. The effect of the ash on the combustion process, its fusibility, and physical properties were next dealt with, and the lecturer sounded a warning that, for the successful development of powdered fuel firing, reduction of the ash must be effected, so as not to substitute a dust menace for the vanishing smoke nuisance.

Dr. Lessing then gave an account of his work on the influence of catalysts on carbonization. With the aid of lantern slides, the results from experiments showing the effect of inorganic addition to sugar, cellulose, and coal were demonstrated; and Dr. Lessing indicated that the present empirical processes of carbonization will have to be modified or replaced by methods allowing the carbonizing equilibrium to be influenced at will towards solid, liquid, or gaseous products.

The lecture was illustrated by experiments, and a great number of specimens of coal ingredients and ashes showing the distribution of mineral matter.

An Invitation.—Members of the Institution of Gas Engineers are invited to attend a meeting on Wednesday, May 6, at 6 p.m., at the Institution of Civil Engineers, when Mr. J. Carnaghan will introduce for discussion "A Standard Code for Tabulating the Results of a Heavy Oil Engine Trial." The chair will be taken by Captain H. Riall Sankey, C.B., C.B.E., Chairman of the Special Committee tabulating the results of Heat-Engine Trials.

CO-OPERATIVE DISPLAY BY JUNIOR ENGINEERS.

SMOKE ABATEMENT.

COAL CONSERVATION.

A good idea comes to us from Dartford, which may be suggestive, from the educational point of view, to junior engineers engaged in different branches of the profession. Organized by the North Kent Section of the Institution of Junior Engineers, a very successful engineering exhibition was held on a recent Saturday, in the dining-hall at the works of Messrs. J. & E. Hall, Ltd., at Dartford. A number of firms, including the South Suburban Gas Company, entered heartily into the co-operative display, and made interesting contributions, as will be indicated presently. Over these the junior engineers in the different branches of the profession lingered, and sought much information from their fellows.

The exhibition was opened by Mr. H. J. Ward, Chairman of Messrs. J. & E. Hall, Ltd. In the course of his remarks, he made it clear that in his opinion the education of the younger members of the engineering profession should receive most careful attention, and that every opportunity should be given them to improve their knowledge, as the future of the engineering industry depended upon the juniors. In his view local exhibitions of this kind were a very great help in stimulating the interest which is so necessary. He also spoke of the loss of British orders to foreign shipyards, but stated that he felt convinced that brighter days were in view.

The following firms contributed exhibits:

Messrs. J. & E. Hall, Ltd.	Refrigerating machinery, machine tools, "Todd" oil fuel burners, &c.
Messrs. Vickers, Ltd. (Dartford)	Shells, bomb carrier for aeroplane, &c.
Messrs. Vickers, Ltd. (Erith)	Machine guns, high-speed twist drills, &c.
Messrs. Vickers, Ltd. (Crayford)	Aero engine (9 cylinder BR), gun parts, &c.
Messrs. Vickers, Ltd. (Creek Works) ...	Specimens of ply wood.
Messrs. Mitchell Bearings, Ltd.	Ball bearings, &c.
Messrs. Heath, Ltd. ...	Optical and surveying instruments.
Messrs. Walker Crosweller	Thermometers, CO_2 recorders, &c.
Messrs. J. C. Beadle ...	Wireless apparatus.
Messrs. Fraser & Chalmers	Turbine parts.
Messrs. Elliott Bros. (London)	Electrical apparatus, voltmeters, &c.
Messrs. Aveling & Porter	Steam steering engine of the rotary-valve type.
Captain J. C. De Wardt	Wireless apparatus.
Marconi & Western Electric Company ...	Wireless apparatus.
Westinghouse Morse Chain Company ...	Model chain drive, &c.
The Swedish General Electric Company ...	Single-phase electric motor.
Pneumatic Plate Tightener Sales Company	Plate tightening gear.
Higham Engineering Company	Speed reduction gear.
Messrs. Johnson & Phillips	Switch boards.
Messrs. Callanders Cable Company ...	Electric cables and insulators.
Messrs. Pitter Gauge Company (Woolwich)	Gauges.
South Suburban Gas Company	Smoke abatement, furnaces, and oxy-coal gas cutting.

The Gas Company's exhibit comprised a stand dealing with smoke abatement and conservation of coal; the exhibits being supplied by the British Commercial Gas Association. The furnaces shown were supplied by Radiation Limited and Messrs. Fletcher Russell & Co. They included open-oven, high-speed steel, and muffle furnaces. There were also shown the Keith-Blackman method of mixture control, and Messrs. Hancocks' oxy-coal gas cutting and welding plant. Demonstrations were given on these, in which keen interest was taken. This exhibit was organized by, and under the charge of, Mr. E. L. Oughton, the Sales Superintendent of the South Suburban Gas Company.

SPENT OXIDE AND SPENT OXIDE BURNERS.

One of a series of papers submitted at a joint meeting on April 7 of the Chemical Engineering Group and the Birmingham Section of the Society of Chemical Industry, was by Mr. P. PARRISH, A.I.C., M.I.Chem.E., on "The Combustion of Sulphur Containing Materials in Hand and Mechanical Burners."

The author said there can be no doubt that burners which admit of a continuous feed of sulphur, either in granular form or as molten sulphur, are to be desired from all points of view. Labour costs are reduced appreciably, burner gases of any concentration from 5 to 15 p.ct. can be obtained with uniformity, and the plant to which the burner or set of burners is attached can be operated with clock-like regularity. The efficiency of combustion exceeds 99·5 p.ct. One need not hesitate to instal mechanical sulphur burners, because there is no dust problem such as arises when spent oxide and pyrites are the raw materials. Although the initial cost of hand burners is somewhat less than mechanical burners, labour expenses are heavier, and the same uniformity of conditions cannot be maintained. For oleum plants combustion in mechanical burners is ideal from several points of view.

It is interesting to note that increasing quantities of brimstone are being used in this country, as is revealed by the following figures, which also show the relative importance of the other two principal sources of sulphur dioxide.

Sulphur Containing Materials Used in the United Kingdom.

	1923.		1923-24.
Pyrites	800,000	..	350,000
Spent oxide	110,000	..	148,000
Sulphur	3,000	..	66,000

The table given above indicates that the quantity of spent oxide used in this country has increased by approximately 35 p.ct. during the last decade.

Spent oxide is a complex mixture of a large number of bodies and contains varying quantities of moisture, tar, sulphur, and ferrocyanides. The following analysis, taken from "Cyanogen Compounds," by H. E. Williams, affords an idea of the complexity of the material:

Analysis of Spent Oxide.

	P.Ct.
Free sulphur	44·70
Moisture	17·88
Ferric monohydrate	5·26
Ferrous monohydrate	0·25
Basic ferric sulphate	1·25
Ferric ammonium ferrocyanide	2·80
Ferrosoferric ammonium ferrocyanide	2·50
Ferric pyridic ferrocyanide	1·20
Organic matter, peat fibre	4·68
Tar	1·21
Silica	1·05
Naphthalene	0·72
Pyridine sulphate	0·77
Ammonium sulphate	2·05
Calcium sulphate	0·12
Ferrous sulphate	0·02
Ammonium thiocyanate	1·30
Sulphur otherwise combined	1·33
Organic matter soluble in alkalis (humus)	1·54
Combined water and loss (by diff.)	2·36
	100·00

It is not economical to deal with spent oxide containing less than 40 p.ct. of sulphur. Indeed, buyers usually specify a minimum content as 45 p.ct. of sulphur, and not more than 10 to 12 p.ct. of moisture. Large quantities of material are available containing 50 to 55 p.ct. of tar-free sulphur.

Purification of Coke-Quenching Water.

Quoting from a contemporary, in the section dealing with progress in gas technology, the "American Gas Journal" says that water from coke-quenching apparatus contains notable quantities of hydrogen sulphide and hydrocyanic acid, and may be purified by passing through rough filters containing coke, which retain 85 p.ct. of the acids present. Final treatment with concentrated bleaching powder solution, to which sodium carbonate has been added, is recommended. The amount of bleaching powder required may be determined by adding 3 or 4 drops of a sulphuric acid solution of indigo-carmine to 200 c.c. of the water, and titrating with alkali hypochlorite solution until the blue colour disappears.

Midland Association of Gas Engineers and Managers.—The spring general meeting of the Association will be held at Oxford on Thursday, May 7.

Institution of Gas Engineers.—The Right Hon. Sir Philip Cunliffe-Lister, K.B.E., M.C., M.P., President of the Board of Trade, has accepted an invitation to luncheon with the Institution of Gas Engineers, at the Royal Automobile Club, on Wednesday, June 10 next.

NORTH BRITISH ASSOCIATION OF GAS MANAGERS.

The portion of the proceedings at the Spring Meeting of the Association in Edinburgh which was given in last week's "JOURNAL" included two papers on the subject of maintenance—one by Mr. J. W. Napier and the other by Mr. George Keillor. Interposed between these was an address by Mr. J. W. M'Lusky, of Glasgow, on the same subject. A report of this follows.

MR. M'LUSKY ON MAINTENANCE.

Mr. M'LUSKY said many gas managers to-day were losing business, and many were destined to lose business, because they had not yet realized that they were not doing half enough for the gas consumer. Generally speaking, the conditions found in the trial district in Glasgow were, in a more or less degree, applicable to the other districts. Whether or not it was from fear of being charged excessively for repairs to gas appliances and piping, some consumers seemed quite content to jog along with any makeshift. This question of makeshift fittings had been brought home to them very forcibly in Glasgow as the outcome of practical experience. Frankly, they did not know anything like one-half of the situation until they went out in the city to investigate and explore. Indeed, he was so impressed with what had been discovered that he wanted to ask his brother gas managers if they were familiar with the actual conditions in their own particular districts. Just by way of challenge, he desired to ask them how much more they knew about each house of their own district since last September, when he submitted a report as to what was then being done in Glasgow.

Going over some of the districts that were being maintained, and seeing the condition of piping—especially in the poorer and business parts of the city—one did not really wonder at Mr. Butterfield's warning in his report to the Board of Trade. Indeed, in order to emphasize this point, he had that day brought with him a few typical examples of what had been discovered. In a large factory using high-pressure gas, which was visited in the course of maintenance, complaint was made of very poor lighting and big gas accounts. The complaint of poor lighting was justifiable from the illumination provided—scarcely one burner was in proper order—and the firm were considering the question of changing over to another form of lighting. Maintenance fitters were soon on the job; and when the overhaul had been completed, the remark was made that the firm had not had such splendid lighting for years. The trouble in this case was that whoever had the work of annually overhauling the system did not seem to understand the type of burner, and in almost every case the injector hole had been enlarged to nearly six times its original diameter. For the inspection of his colleagues, he had brought with him a specimen of the injector used. That was only one instance of trouble with high-pressure gas. So far, in Glasgow, they had dealt with fifteen installations; and the results had been satisfactory.

Then he proposed exhibiting at this stage a piece of compo piping with about a foot of red indiarubber tubing tied to it. This was cut from a gas supply to a bracket in a bedroom where an old lady had been lying ill for years. It was found behind the window-shutter, where the supply pipe was running. The old lady said she always noticed a smell of gas. There was a bad leak; and the patient had certainly little chance of recovering while this piping was in use. Then he produced another contraption which was supplying a gas ring. It was a piece of compo piping to which was attached a bit of asbestos and rubber tubing, on which a Glasgow Gas Department crane was fixed. There was connected to this again a piece of flexible metallic tubing. Again, there was a specimen of a ¼-in. crane fixed to a piece of ⅜-in. compo piping by means of a cloth wrapping. These, he might point out for the information of the meeting, were only a few cases out of hundreds dealt with.

Proceeding, Mr. M'Lusky explained that between the month of June last and the end of February of the present year—during two months of that period maintenance was suspended—no fewer than 2300 consumers in the city of Glasgow were requested by maintenance fitters to call-in plumbers to deal with escapes of gas in private pipes. When a maintenance fitter found an escape of gas in private piping, he requested the consumer to call-in a plumber. At the same time he recorded this fact on a card provided for the purpose. The arrangement was that the inspector should call on the consumer within a week, and inquire if the escape had been duly attended to. If not, an appeal was again made to the consumer to summon a private plumber.

The radiator, though one of the most serviceable gas-heating appliances, was also one which had more abusive language showered on it than any other gas-heating agent; and yet the appliance was not to blame. In Glasgow their experience of radiators which had been fitted by maintenance men was that in nearly every case the apparatus had been entirely neglected. Some of them were even allowed to burn day after day without having a drop of water added. Of course, this sort of thing was bound to result in defective loops and inoperative

diaphragms. The automatic check action regulating the gas supply was rendered useless, with the result that big gas accounts were incurred. In Glasgow all hired radiators were thoroughly overhauled a year ago, and when met with during maintenance private radiators had been dealt with. During the past winter, in order to ensure that these appliances were efficient, a squad of men had been constantly employed watering and reporting defects, with the result that this most useful appliance had come into its own. The piece of sheet iron, shaped like a diaphragm, which he held in his hand, was what they had met with repeatedly in radiators. Leather and zinc were also found in use. The poor appliance was often blamed by the consumer, and yet the private tradesman had rendered his account and drawn his money for repairing it A small piece of glass tube which he exhibited represented part of an alleged gauge glass tube from a radiator. It was a piece of glass tube for a baby's feeding bottle. Gas fires of antiquated design were met with regularly; and it was only by a system of maintenance that consumers could be shown the disadvantages of their use. Old-type gas fires were, therefore, gradually being eliminated.

In regard to gas lighting burners, fitters and inspectors alike reported on the general satisfaction of consumers once lighting burners had been overhauled. Of course, in certain cases, burners were past useful service and repair, and sometimes the service of the maintenance fitter did not show any improvement. Maintenance had, however, brought before them in Glasgow the fact that, had the system been in vogue ten or fifteen years ago, they would to-day be counting among their lighting consumers many who introduced other lighting agents because of unsatisfactory illumination from their gas burners. To-day, in Glasgow, they were holding consumers who, but for the introduction of the maintenance service, would have been lost to the industry. They realized, when on maintenance, that every factory, workshop, hall, church, school, and public institution had not gone over to electricity; and by their efforts they expected to see gas retained wherever it was now used. It might be said that it was a costly business to replace globes and gas mantles broken by maintenance fitters; but the experience in Glasgow showed that it represented a small item. The number of lighting appliances overhauled between June, 1924, and January, 1925, was 317,845. During this period, the number of mantles and globes broken and replaced was: Gas mantles, 449, equal to 0·14 p.ct. of burners; and globes, 52, equal to 0·016 p.ct. of burners. Further experience had shown that maintenance fitters made good salesmen—from June, 1924, to January, 1925, no fewer than 2631 orders were taken for cooking, heating, and lighting appliances.

Mr. M'Lusky said that, on the question of expenditure, he was now in a position to give some interesting figures. When he reported first of all to his Committee on the Glasgow trial scheme, the figure of 1½d. per 1000 c.ft. was mentioned. He was told that it could not be done for that, but eventually he was tied-down to 1¾d. Of course, it might be said that officials could produce figures to prove anything; but he would remind them that a balance-sheet was, after all, a balance-sheet. Experience showed that, after a certain period, they were able to report to the Committee that the cost was about 1¾d. per 1000 c.ft. The latest figures, however, revealed the cost as being 0·592d., or just over a halfpenny, per 1000 c.ft. Sometimes he did feel he was a brave man, and imagined he could start a good business in Scotland, and actually make a fortune, if he set out to maintain gas appliances at 1d. per 1000 c.ft. If he spent a halfpenny to make a halfpenny, this surely was good business. The cost per appliance for labour was 4·46d.; for material, 1d.; and overhead charges, 1·58d.—making 7·04d. per appliance. The details applicable to the cost per 1000 c.ft. were: Labour, 0·375d.; material, 0·084d.; and overhead charges, 0·133d.—giving a total of 0·592d. Applicable to the cost per therm made, the details were: Labour, 0·080d.; material, 0·018d.; and overhead charges, 0·028d.—a total of 0·126d.

These were marvellous figures, and the gas industry in Scotland had to admit it. In Glasgow they estimated that they had 1,250,000 appliances contained in 213,447 premises. They were at the moment maintaining 995,038 burners and appliances. In September last he reported that there were being maintained 410,000 appliances, so that in the past six months they had increased 140 p.ct. By so doing, they had reduced the expenditure from 1¾d. per 1000 c.ft. to 0·592d. In these figures he thought there was sufficient to show that, the bigger the maintenance scheme became, the cheaper it got. If fitters broke mantles or globes in the course of their examination, these were replaced. Since the Glasgow scheme was inaugurated, the percentage of broken mantles was 0·14, and the percentage of broken globes 0·016.

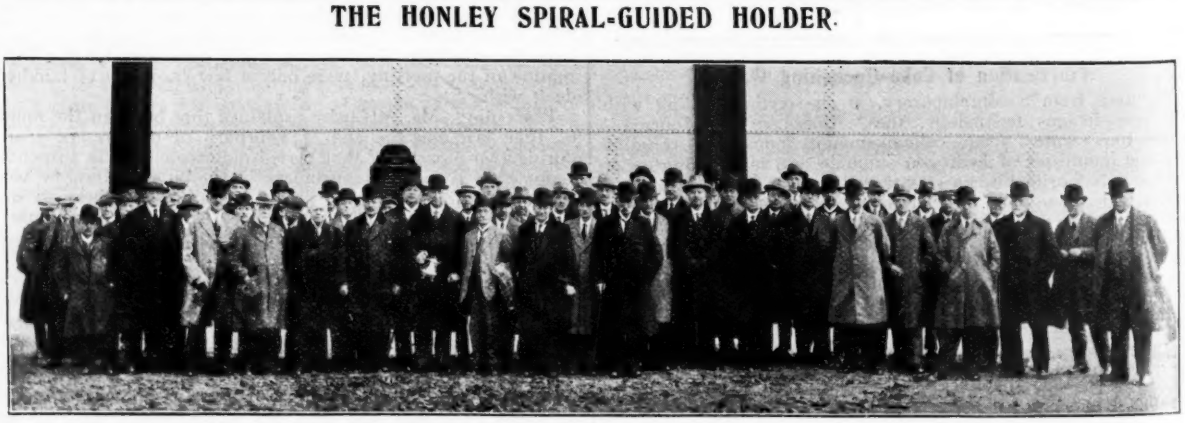
In conclusion, Mr. M'Lusky urged upon every member of the Scottish gas industry the importance of bringing this question of maintenance before company and corporation in some shape or form. If it was not practicable to get a whole town mapped-out on a scheme of maintenance, it might be feasible to experiment on a particular area or on a municipal ward. Something, however, ought to be done to drive home the thin end of the wedge, and there should be a general insistence on the policy that the gas industry in the future was not going to proceed on the old lines.

[The report of the ensuing discussion will be published next week.]

CAUSE OF LONDON FOGS.

A paper on "Modern Atmospheric Conditions," with special reference to London, was read recently before the Royal Society of Arts by Dr. J. S. Owens (Superintendent to the Advisory Committee on Atmospheric Pollution, Air Ministry), in which he advanced a new explanation of the cause of smoke fogs. He pointed out that during a thick smoke haze, and assuming an upper limit of 300 to 400 ft., there would be something like 200 to 250 tons of soot suspended over London. Further, the whole of this soot can be produced in about three hours by the fires lighted on a winter's morning. Thus, if Nature's provision for scavenging fails for a few hours, there is ample material for a dense smoke haze. The popular conception of such a condition in London is that there must first be a water fog, and that the globules of water are condensed around smoke particles, while the outer surface of such globules becomes coated with a film of tarry oil, which is supposed to account for their failure to disappear by evaporation, although the air may not be saturated. This, Dr. Owens believes, is an entire misconception; and therefore he put forward, as a more satisfactory explanation, and more in accordance with the facts, the theory that the "London Particular" is caused by a more or less complete replacement of water particles by smoke particles; the water droplets being partially evaporated by the higher temperature, and their place taken by smoke. In support of this view, he quoted various observations; adding that the bearing of this contention upon prevention is evident, since one is driven to the conclusion that, if smoke were not supplied to take the place of the water, London would be more free from fog than its surroundings.

THE HONLEY SPIRAL-GUIDED HOLDER.



PRESENT AT THE INAUGURATION

In last week's "Journal" a report was given of the proceedings at the inauguration of the spiral-guided gasholder at Honley. The above photograph of those present at the official "turning-on" of the gas by the Chairman of the District Council (Mr. G. T. Oldham, J.P.) came to hand too late to include with the report.

ELECTRIC POWER PLANT FOR GAS-WORKS.

Operating Dynamos in Parallel.

By Hugh P. Vowles, M.I.Mech.E., M.A.Min.E.E.

Introductory.

The writer has had twenty-five years' experience in the manufacture, installation, and operation of electric power plant, including several years on a large gas-works. These notes have been compiled in the hope that they will provide some guidance for those who, faced with the question of installing such plant, have had little time or opportunity to acquire the knowledge necessary to ensure the work being carried out satisfactorily. Let it be stated at once that it is not sufficient to rely entirely upon power plant contractors for guidance. The reasons for this statement will be made clear.

A greater diversity of technical knowledge is required on a gas-works than perhaps in any other branch of the engineering profession. It is necessary to have not only civil and mechanical engineering knowledge; one must be something of a chemist as well. It is only natural, therefore, that, with such a wide range of knowledge already required, many gas-works engineers should feel the need of enlightenment concerning the problems peculiar to electrical power plant. They realize that electricity will be used more and more on modern gas-works for such purposes as the operation of retort stoking machinery and telphers, and the driving of exhausters, scrubbers, pumps, and other plant. The difficulty is to select just that portion of electrical engineering data which will meet their needs without involving an exhaustive study, taking up time which cannot well be spared from other matters. To meet this requirement, the writer proposes to deal only with those electrical details which are of immediate practical gas-works interest. A bare knowledge of elementary electrical principles will be assumed, but beyond this the ground will be covered as fully as the scope of a necessarily brief article allows.

It may be noted here that, so long as only one generating unit is installed, the procedure to be adopted is simple. Given a reliable contractor, little difficulty need be anticipated. It is when further units have to be installed, and the works engineer wishes to be independent of any particular contractor, that his troubles are likely to begin if knowledge is lacking.

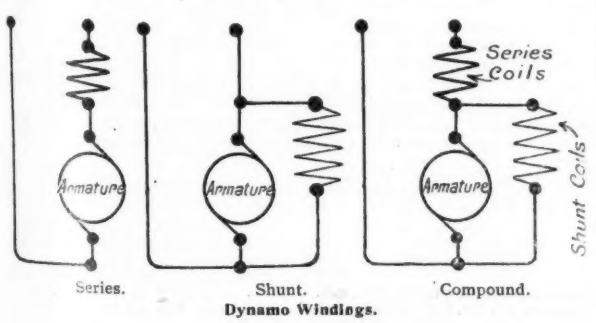
The only type of electric generating plant suitable for the average gas-works is the direct-current, compound-wound dynamo, driven either by steam or gas engine. In order that efficiency or economy shall not be sacrificed, such dynamos must be operated "in parallel." It will be convenient to lead up to a consideration of parallel operation with a few definitions.

Definitions.

Electric windings (as on a dynamo) are said to be "in series" when the end of one is electrically connected to the beginning of another, so as to form one continuous path for an electric current. Such windings are said to be "in parallel" when they provide two or more branch paths for an electric current; the current dividing and afterwards re-uniting at the point where the branches meet. Any branch which serves as a by-pass to another is called a "shunt."

There are three methods of winding direct-current dynamos—"series," "shunt," and "compound." A series-wound dynamo is one in which the field winding is in series with the armature winding and the main external circuit. A shunt-wound dynamo is one in which the field winding forms a by-pass or shunt to the main circuit. A compound-wound dynamo is one in which there are two sets of field windings, one in series with, and the other forming a shunt to, the main circuit.

With a series-wound dynamo running at constant speed, the voltage rises as the current output increases. With a shunt-wound dynamo, the voltage drops as the current increases. With a compound-wound dynamo, the two field windings can



Dynamo Windings.

be proportioned so as to compensate for each other, ensuring constant voltage at all loads, providing speed is constant. Such a dynamo is said to be "level-compounded."

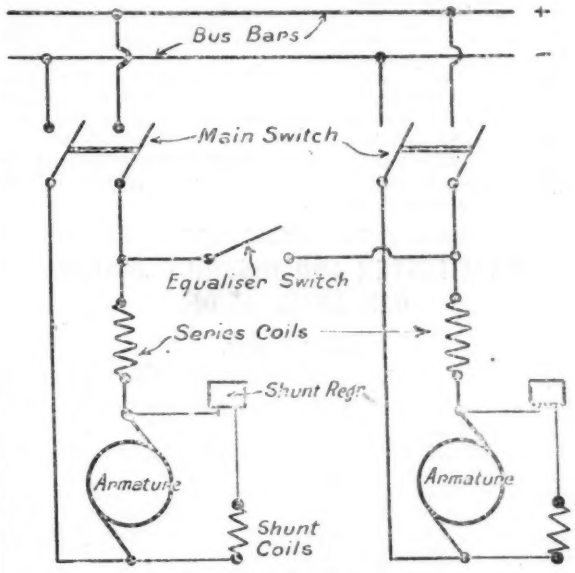
Although constant voltage at all loads is the ideal for normal conditions, some makers design their dynamo windings so as to give a slight rise in voltage, and other makers so as to give a slight drop in voltage, as the load increases. The one design of dynamo is said to be "over-compounded," and the other "under-compounded."

Compound-wound dynamos which differ thus in the degree of compounding will not run satisfactorily in parallel. "Running in parallel" implies that the dynamos are electrically connected by joining like terminals to form a common positive and a common negative terminal. This arrangement results in a combined voltage which is the same as that of any one machine; but the current available at the common pair of terminals is equal to the sum of the individual capacities of all the machines so connected.

Parallel Running.

Dynamos being designed to give greatest efficiency under full-load conditions, full economy of operation can only be obtained when each dynamo is worked as much as possible at its maximum output. If, instead of running in parallel, each dynamo feeds separate sections of a gas-works without electric interconnection, it is possible that several dynamos will each be running only partially loaded. There may not be sufficient load on any one circuit to load its particular dynamo fully. This means inefficient operation, while standing charges are the same for both efficient and inefficient operation. If, on the other hand, all dynamos are connected in parallel, then one may be started-up and fully loaded from any or all of the external circuits. If the total load increases, another dynamo can be switched in, and so on; no dynamos being used until those already running are fully loaded, and therefore working at maximum efficiency.

The ratio of the actual electric energy consumed to that which would be consumed with a continuous maximum demand is called the "load factor." A 100 p.ct. load factor represents maximum efficiency; and the economy to be secured by parallel running may be illustrated by the statement that in the case of



Compound Dynamos in Parallel.

small electric generating sets (say, 50 to 100 kw. capacity), the relative costs per kilowatt per hour at 100 and 25 p.ct. load factors are approximately in the proportion of 100 to 260.

Plant Specification.

It will be clear from the foregoing that when supplementary generating sets are being ordered, it is essential to see that these are designed to operate in parallel with those already installed. Unless this is clearly stated in the works engineer's specification, the contractors cannot be blamed for offering their standard makes of dynamo, which may or may not be suitable. It is thus not sufficient merely to specify the voltage. Assuming that the tender of a new contractor is more favourable in regard to price, delivery, &c., the engineer will naturally desire to feel free to select this particular make. This he can safely do if he covers the question of parallel running in his specification.

Let us assume that this is not done, and a new dynamo is supplied with a degree of compounding different from one already in use. Suppose the existing machine is under-compounded, the new one over-compounded. What will happen when these machines are coupled in parallel? For the sake of convenience we will call the dynamos "A" and "B." Dynamo "A," being under-compounded, will give a voltage which drops as the load increases. Dynamo "B," on the other hand, will give an increased voltage at the higher loads. "B" will therefore tend to take more than its due proportion of load, causing a still greater discrepancy in voltage; and so on progressively, until all the load is thrown on to this machine. In the end machine "B" may overpower, and send a reverse cur-

rent through the armature of "A," tending to drive it as a motor. Damage may ensue, resulting in serious electrical breakdown.

Even when this risk is guarded against in the specification as indicated above, and the machines are designed for parallel running, there is still a possibility of varying speeds giving rise to varying voltages. This is why engines driving dynamos should be equipped with governors giving very close speed regulation; and this also should be indicated in the specification.

As a further precaution, it is usual to specify that the switchgear shall include "automatic circuit breakers with no-volt and overload release." Any drop in voltage, or any undue increase of load, will then result in the circuit breaker automatically opening the circuit and so preventing damage.

Actual Operation.

Assuming, now, that the various precautions indicated here have been taken, and that the dynamos are designed and equipped with suitable switchgear for parallel running, there remains only the actual procedure for putting the machines into operation together. They are connected electrically through switches to common terminals on the back of the switchboard called "bus-bars," from which feeders supply the external circuits on the gas-works. An "equalizing switch" is also provided, joining the extremities of the fixed windings (at the dynamo brushes) in parallel. The object of this is to ensure that the current to the common external circuit shall flow in the same direction through each series winding with equal magnetizing effect on the two fields. Then, in order to switch-in the second dynamo, it must first be run until its voltage is approximately the same as that of the machine already on load. Then, and not until then, the equalizing switch may be closed, followed by the closing of the switch linking the machine to the bus-bars.

To cut-out any one dynamo, first reduce its speed slightly until it is supplying very little current, open the main switch, and finally the equalizing switch.

An alternative arrangement, involving a little more expense, is to have the switchboard provided with a third, or equalizer, bus-bar. In this case three connections are taken from each dynamo to the switchboard; and the sequence of operations indicated above is taken care of automatically by specially designed triple-pole switches, with a delayed contact for the equalizer pole on each switch.

MANCHESTER AND DISTRICT JUNIOR GAS ASSOCIATION.

Annual Meeting.

The Annual Meeting of the Association was held at the Grand Hotel, Manchester, on April 4—Mr. H. E. Stone (Birkenhead) presiding.

The report was formally approved, after being read by the Hon. Secretary (Mr. J. Alsop). The number of members on the books last year was 217. Since then 18 have been enrolled, 4 have resigned, 10 have ceased to be members by operation of rule 4, 3 have left the district, and there have been 3 deaths; leaving the membership at 215—a decrease of 2.

The Council have elected the Past-President of the Institution of Gas Engineers, Mr. S. Tagg, an Hon. Member of the Association, in recognition of the valuable services he has rendered during his long membership.

The Secretary read a letter from the Institution of Gas Engineers relative to the employment register.

The President presented the prizes for papers read during the session. The awards were given to Mr. W. B. Payne, of Liverpool, and Mr. A. D. Young, of Burnley.

The rule relative to associate membership, passed in 1922, was deleted from the books.

Mr. Stone, the outgoing President, introduced the President-Elect, Mr. J. T. Haynes, of Bolton.

Mr. Haynes moved a vote of thanks to Mr. Stone for his services as President, and presented to him, on behalf of the Council, a certificate on parchment, as a reminder of his presidential year.

Election of Officers for 1925-6.

Junior Vice-President—Mr. W. H. Battersby (Bury).
Hon. Secretary—Mr. J. Alsop (Bolton).
Hon. Treasurer—Mr. I. H. Massey (Oldham).
Auditor—Mr. F. A. Collier (Oldham).
Members of the Council—Messrs. Hailstone (Rochdale), Livesey (Stretford), H. B. Knowles (Lancaster), Young (Burnley), and Prince (Heywood).

After the meeting, the members had dinner together.

The guests of the evening were Messrs. L. Lees (Chairman of the Birkenhead Gas Department), A. L. Holton (Manchester), J. W. Scott (Messrs. R. & J. Dempster, Ltd.), Marsden (National Gas Engine Company, Ltd.), Gillett (President of the Yorkshire Junior Gas Association, and Horwill (Hon. Secretary of the Yorkshire Juniors).

UTILIZATION OF WASTE HEAT FROM COKE OVENS.

[Extracts from a Paper read by Dr. A. Parker at a Meeting of the Coke Oven Managers' Association (Midland Section) on Feb. 28.]

It is assumed that the coal carbonized contains 30 p.ct. of volatile matter, and Table I. gives the average yield of products when this coal is carbonized in waste-heat, recuperative, and regenerative ovens.

Table I.—*Results per Ton of Coal.*

Coke made	14 cwt.
Temperature of coke as discharged	1000° C.
Gas made (debenzolized, saturated at N.T.P.)	11,000 c.ft.
Calorific value, gross	500 B.Th.U. per c.ft.
,, ,, net	440 ,, ,, ,,
Composition by volume—	P.Ct.
CO_2	2·5
C_nH_m	2·0
O_2	0·5
CO	6·0
H_2	53·0
CH_4	27·0
N_2	9·0
	100·0

Type of Oven	Waste Heat.	Recuperative.	Regenerative.
Fuel gas used, c.ft.	9000	7000	5500
Surplus gas available, c.ft.	2000	4000	5500
Temperature of waste gas, ° C.	1100	700	300

Dry Cooling of Coke for Steam Raising—Sulzer Process.

The mean value of the specific heat of coke between 200° and 1000° C. is approximately 0·39. The heat lost by 1 ton of coke in cooling from 1000° to 200° C. is therefore 1,258,000 B.Th.U., which would be sufficient to raise 1296 lbs. of steam from and at 100° C. In practice a certain amount of heat is lost by radiation and convection and in heating-up the circulation gas from ordinary temperature to that at which it finally leaves the boiler. On the other hand, some heat is developed by the combustion of the air with a small fraction of the coke when it first enters the cooler. Tests carried out on the Sulzer plant installed at the Keilehaven Gas-Works and at Schlieren have yielded results which are equivalent to evaporations from and at 100° C. of from 1060 to 1250 lbs. per ton of coke. The proprietors of the process have guaranteed 740 lbs. of steam at 100 lbs. pressure from water at 15° C., which is equivalent to 884 lbs. from and at 100° C. Accepting this figure of 740 lbs., the amount of steam which could be raised at 100 lbs. pressure from 14 cwt. of coke is 518 lbs. Assuming that in the production of electrical energy the consumption of steam per kilowatt hour is 25 lbs. at 100 lbs. pressure, then 518 lbs. would generate 20·7 kw. The fan power required on the Sulzer plant at the Keilehaven Works was 20 kw., and the amount of coke treated was 6 tons per hour, so that in the same proportion a deduction of 2·3 kw. must be made from the 20·7 kw., leaving 18·4 kw. as the net energy available. The net energy which may be recovered by cooling 14 cwt. of coke from 1000° C. to 200° C. may therefore be expressed as 460 lbs. of steam at 100 lbs. pressure, or 18·4 kw.

Steam Raising by Surplus Gas.

With boilers specially designed for firing with gaseous fuel, an efficiency of 80 p.ct. of the net value of the fuel should be attainable in practice.

The net calorific value of the coke-oven gas is 440 B.Th.U. per c.ft. With a thermal efficiency of 80 p.ct. and a consumption of 1000 c.ft., 352,000 B.Th.U. would thus be utilized in raising steam. The amount of steam which could be raised at 100 lbs. pressure from water at 15° C. would therefore be 303 lbs. Calculated on this basis of 303 lbs. of steam per 1000 c.ft. of gas burned under the boiler, the amounts of steam which should be raised from the surplus gas from the carbonization of 1 ton of coal in the different types of ovens, are given in Table II.

Table II.—*Amounts of Steam from Surplus Gas.*

Type of Oven	Waste Heat.	Recuperative.	Regenerative.
Surplus gas from 1 ton of coal, c.ft.	2000	4000	5500
Steam at 100 lbs. from water at 15° C., lbs.	606	1212	1666
Electrical energy in kilowatt hours (basis 25 lbs. of steam)	24·2	48·5	66·6

Surplus Gas and Gas Engines.

The brake thermal efficiency of an ordinary modern gas engine working at three-quarter load is 25 p.ct., and at one-third load 20 p.ct., calculated on the net calorific value of the gas. (*Vide* Clerk, Smithells, Cobb Report to the Institution of

Gas Engineers, 1919.) For the purpose of deducing modest estimates of the power which should be developed by the use of surplus coke-oven gas in gas engines, it is therefore assumed that the thermal efficiency is 20 p.ct. on the net calorific value. The net thermal value of the coke-oven gas considered in Table II. is 440 B.Th.U. per c.ft., so that, of the heat value of 1000 c.ft., 88,000 B.Th.U. would be converted into power. Since 1 B.H.P.-hour is equivalent to 2545 B.Th.U., 1000 c.ft. of gas would develop 34·6 B.H.P. The power developed by the surplus gas from the three types of coke oven would therefore be as given in Table III.

Table III.—*Surplus Gas and Gas Engines*

Type of Oven	Waste Heat.	Recuperative.	Regenerative.
Surplus gas from 1 ton of coal, c.ft.	2000	4000	5500
Power developed by gas engines, B.H.P.	69·2	138 4	190·3
Kilowatt-hour equivalent (90 p.ct. generator efficiency)	46·4	92 9	127·7

Exhaust-Heated Boilers and Gas-Engine Plant.

It is generally recognized that, even with modern internal combustion engines, approximately 40 p.ct. of the heat of the fuel is carried away through the exhaust pipe. From trials which have been carried out (*vide* I.C.F. Statham, Institution of Mining Engineers, Nov. 19, 1924), it appears that, with properly-designed boilers, about 2 lbs. of steam from and at 100° C. may be raised from the exhaust gases of a gas engine per B.H.P.-hour developed. It is not usually recommended that this method of heat recovery should be employed with engines of less than 100 H.P. Gas engines utilizing surplus gas from coke-ovens would, however, generally be of much larger capacity. Accepting the figure of 2 lbs. of steam from and at 100° C. per B.H.P.-hour, then the amounts of steam which could be raised in this manner from the three types of oven are as shown in Table IV.

Table IV.—*Exhaust-Heated Boilers and Gas-Engine Plant. Results per Ton of Coal Carbonized.*

Type of Oven	Waste Heat.	Recuperative.	Regenerative.
Steam at 100 lbs. from water at 15° C. from gas-engine exhaust gases, lbs.	115	231	318
Electrical energy in kilowatt hours	4·6	9·2	12·7

Waste Gases and Steam Raising.

For the complete combustion of 100 volumes of the fuel gas the composition of which is given in Table I., the theoretical amount of air required is 442 volumes; and the volume of the product gases when reduced to 15·5° C. and 30 in. mercury and saturated with water vapour, would be 400·5 volumes. If it be assumed that the combustion would be so regulated in practice that 541·5 volumes of air would be used, the comparative amount of the waste gases would be 500 volumes at the points at which the products leave the battery of ovens. The composition of the waste gas would then be represented by 8·3 p.ct. of CO_2 and 4·2 p.ct. of oxygen; in addition, the water vapour carried by the fuel gas and air, and resulting from the combustion of the fuel gas, must be taken into account.

Table V.—*Waste Gases and Steam Raising.*

Type of Oven	Waste Heat.	Recuperative.	Regenerative.
(1) Fuel gas used, c.ft.	9,000	7,000	5,500
(2) Volume of waste gas leaving installation (reduced to 15·5° C., 30 in. saturated), c.ft.	45,000	35,000	27,500
(3) Weight of water vapour accompanying waste gas, lbs.	504	392	308
(4) Temperature of waste gas leaving installation, °C.	1,100	700	300
(5) * Sensible heat of waste gas and water vapour, therms	27·64	14·96	6·85
(6) * Heat value of waste gas entering boiler, therms	25·43	14·21	6·71
(7) Volume of waste gas entering boiler (reduced to 15·5° C. and 30 in. saturated), c.ft.	58,500	45,500	35,750
(8) Composition of waste gas at inlet of boiler: Volumes p.ct. CO_2	6·4	6·4	6·4
O_2	8·0	8·0	8·0
N_2	85·6	85·6	85·6
	100 0	100·0	100·0
(9) Temperature of gases at inlet of boiler, °C	821	534	236
(10) Temperature of gases at outlet of boiler, °C.	250	250	..
(11) * Heat value of gases at outlet of boiler, therms	11·34	8·82	..
(12) Heat available for raising steam, therms (gross)	14·09	5·39	..
(13) Heat available for raising net steam, due allowance being made for fan power, &c., therms	13·10	5·01	..
(14) Net steam at 100 lbs., from water at 15° C., lbs.	1,129	432	..
(15) Electrical energy in kilowatt hours (25 lbs. of steam per kilowatt hour).	45·2	17·3	..

* The heat values include the latent heat of water.

Combining the data given in the first four items of Table V. with the specific heat values given in Partington and Schilling's "Specific Heats of Gases," and calculating from a base line of zero Centigrade, the heat values in item (5) of Table V. are obtained. In practice it is found that during the passage of waste gases from settings of retorts or ovens to waste-heat boilers, large volumes of air leak into the flues, with the result that there is a considerable lowering of temperature. For the purpose of these calculations, it has been assumed that the amount of air infiltration is 150 volumes for every 500 volumes of waste gas. A certain proportion of heat is also lost by radiation and convection from the flues leading from the installation to the boiler. These heat losses have been assumed to be 8 p.ct., 5 p.ct., and 2 p.ct. of the heat values of the waste gases respectively for the three types of oven. These assumptions are necessarily approximate, since the actual losses vary with different installations. After making the necessary allowances for air infiltration and heat losses from the flues, the figures given in items (6), (7), (8), and (9) are obtained.

Summary.

Waste Heat from Coke Ovens.

Type of Oven	Waste Heat.	Recuperative.	Regenerative.
Total energy in kilowatt hours per ton of coal (all waste heat used for raising steam)	87·8	84·2	85·0
Total energy in kilowatt hours per ton of coal (surplus gas used in gas engines—the exhaust gases being passed through a waste-heat boiler—other waste heat used for steam raising)	114 6	137·8	158·8

Whether waste-heat recovery should be practised by all or any of the methods considered, states Dr. Parker, is a question the answer to which must depend on how far the energy developed can be profitably used.

BRITISH ASSOCIATION OF CHEMISTS.

On Friday, April 3, Dr. E. F. Armstrong, the President of the British Association of Chemists, addressed a meeting of the Birmingham Section of that body at the Queen's Hotel. Members were present from the Society of Chemical Industry, the Institute of Chemistry, and the Chemical Society.

Dr. Armstrong spoke on "The Profession of Chemistry; What Can we Make of it?" There was need, he said, in this democratic age, that chemists should take stock of their position; and he believed, when this was done, it would be realized that an organization fuller, and with a broader scope, than anything now existing would be necessary to provide for the various grades of men who might fairly claim to represent the profession of chemistry. He was strongly of opinion that there was no need for the present multiplicity of societies and organizations, each of which was supposed to represent some particular interest. In view of the fact that there were a number of societies in the chemistry profession, he would like to preach the philosophy of the "middle-way" among chemists. One of their troubles was that no one understood them. They could never be what they thought they were unless someone really admired them. Their mission should be to make the nation understand what chemistry was; what it had done; and what it was doing. There was need for new propaganda methods.

Some of them had done their best to bring together societies catering for the interests of various sections of chemists; but such a movement would only succeed when it came from the mass of the members. If it came from the bottom upwards, and there was insistence that the societies should combine, then chemistry would achieve something. What was wanted was a register of chemists, and a central home for chemists in London to start with, and later on, if they could get them, homes in provincial centres. A third ideal was that they ought to have one journal. Everybody who reached a certain attainment in chemistry ought to be registered as a chemist; and this attainment could be measured in a number of ways. He did not see any difficulty in setting-up such a register; and then they would have one body qualified to speak for all chemists. The management would probably present difficulties. One scheme might be that each class would have its own council or committee, and be represented on a basis proportional to the number of the members on a central council. Such a body would be a proper one to watch over the benevolent side of the chemical profession, as well as over professional interests.

If all chemists were one big body like this, one of the duties

would be to promote the cause of chemistry. It would have its scientific group for promoting pure research, as now represented by the Chemical Society. It would have its industrial group, holding meetings for the reading and discussion of papers on applied chemistry. Thus they would be doing work now undertaken by the Society of Chemical Industry. Finally, there could be a third group, interested in the application of engineering to chemistry—a function which was partly filled by the so-called Engineering Group, and the so-called Group of Chemical Engineers. Thus would these become groups of one body, which should be in a position to speak for all chemists on all occasions.

FURNACE DESIGN AND PERFORMANCE.

[Extracts from a Paper by T. R. Speck, of the B.S.A. Company.]

It is interesting to have the views of an actual user of gas furnaces. These are expressed in a paper read before the Birmingham Association of Mechanical Engineers by Mr. T. R. Speck, of the Birmingham Small Arms Company. After stating that gas-fired furnaces are deservedly the most popular in the Birmingham district, the author goes on to consider

Thermal Efficiency.

The thermal efficiency of a furnace may be represented as follows:

Total heat content in B.Th.U. in material leaving furnace, *minus* initial heat content in B.Th.U. on entering furnace, multiplied by 100, and divided by the gross B.Th.U. content of the fuel consumed during the heating of the material.

Let W = weight of metal in lbs.
T_1 = initial temperature of metal, ° Fahr.
T_2 = final " " ° Fahr.
S = specific heat " "

$$\text{Then } \frac{(W \times S \times T_2) - (W \times S \times T_1)\ 100}{\text{Total B.Th.U. value of fuel used}} = \text{thermal efficiency.}$$

The specific heat of metals varies at different temperatures, and for mild steel from zero to melting-point is about 0·160 to 0·165. This figure, though not strictly correct, will give reasonable accuracy for ordinary annealing and hardening temperatures. There does not appear to be any information available as to the effect of the introduction of nickel, chromium, &c., on the specific heat of steels.

The lower curve B on fig. 1 shows the B.Th.U. content in 1 lb. of 0·30 carbon steel at various temperatures. The correct specific heat figures for the different temperatures (as given by Meuthen) have been used. The straight line indicates the amount of error produced by using the mean figure of 0·160. The upper curve gives the thermal efficiency of a furnace fired by gas of a calorific value of 480 B.Th.U. gross, when 1 lb. of steel is raised by 1 c.ft. of gas to the various temperatures shown. The initial temperature of the steel has been assumed as 62° Fahr. in all cases. To find the efficiency when different quantities of gas are used per lb. of steel heated, divide the percentage efficiency shown by curve A by the number of cubic feet used. The above curves will be found very useful in going into the question of furnace economy. Thermal efficiency is one of the readiest means of comparing the performance of different furnaces. There are, of course, other factors that count, such as even temperature distribution, &c.

Need for Standardized Tests.

When selecting a furnace for a particular job, it is difficult to find out exactly what the fuel consumption is going to be under stated conditions. Some makers base their estimates on gas consumed per pound of metal heated; others appear per the superficial area of the furnace chamber—a figure which may vary from 10 to 15 c.ft. of gas per sq. ft. at temperatures from 800° to 900° C. The latter method may be reasonably correct for some furnace loads, but varies considerably with different weights and nature of load. It would be of great assistance to the furnace buyer if some standardized form of test could be adopted for each class of furnace. He would then be able to satisfy himself as to the relative merits of various machines offered, and price would only affect the issue in so far as value for money was concerned. A recognized test of this description could also be a guide to the engineer, helping him to decide on the economic life of the furnace linings, &c. In any form of standardized test, thermal efficiency should be given a prominent place, as also should the fuel consumption required to maintain a definite temperature with the furnace empty.

The chief use of the thermal efficiency figure is for purposes of comparison. If the machines are required for general purpose work, it will be a good guide as to which furnace is likely to prove most economical—always assuming that the size and the general design are suitable for the work. There are many reasons why the true thermal efficiency cannot often be obtained in practice—for example, scale or grease on the work may affect the rate of absorption; and work in pots can be heated much quicker if suitably distributed throughout the furnace than if packed together in a heap. It will be readily realized that a hundredweight of steel in billet form will absorb the same number of B.Th.U. on being heated from (say) 600° to 900° as will a hundredweight of thin coil springs; but as the latter offer far more surface area for the absorption of heat, it follows that, with the furnace at the same temperature, they reach the temperature required in much less time than the billet, while the radiation, flue, and other losses, which in most furnaces represent over 60 p.ct. of the heat generated, are more in proportion to the time taken for the operation. Carburizing work in pots shows up even worse than the billets; for, not only is the work well insulated by the carburizing material in the pots, but, after it has reached the proper tem-

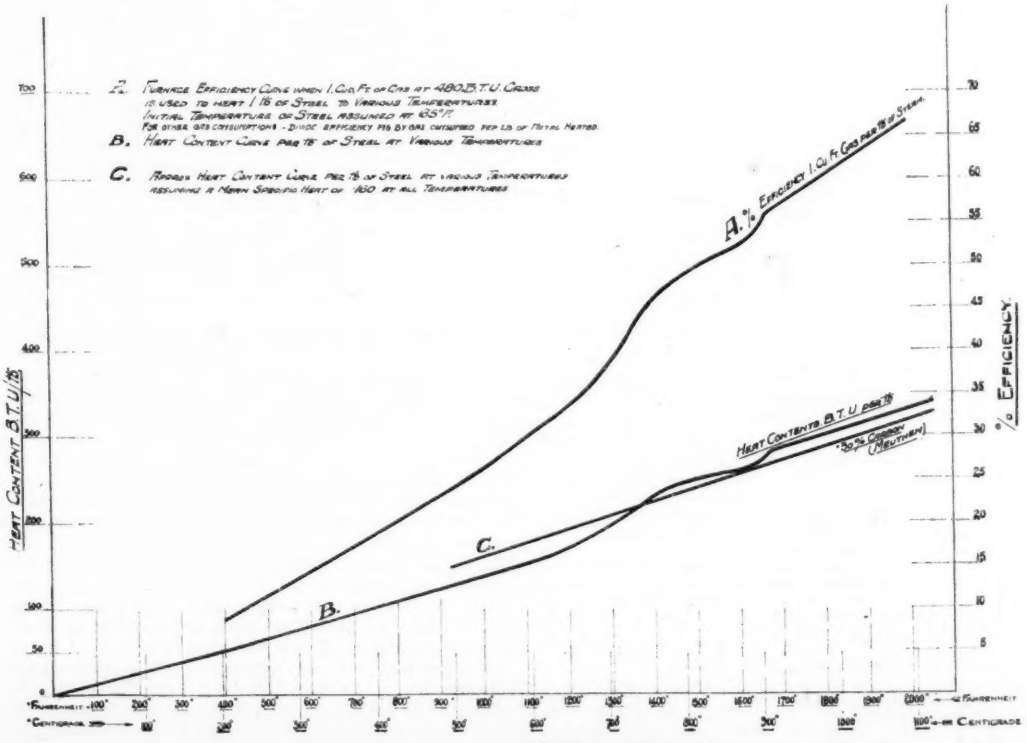


FIG. 1.—HEAT CONTENT AND EFFICIENCY.

perature, a long period is required to obtain the necessary depth of carbon penetration.

There is scope for development in the control of combustion and furnace atmosphere.

FURNACE ECONOMY.

Furnace economy cannot be obtained unless proper attention is given to the matter of insulation. The 4½ in. or so of firebrick sometimes met with is by no means adequate. The makers of this class of furnace must, of course, be aware of this fact, so one can only presume that price is often the factor which most influences the purchaser, and that insufficient attention is given to the efficiency and other merits of the furnace. Good results can be obtained in furnaces required for temperatures of about 900° C. if the usual firebrick lining is enclosed by 4½ in. of insulating brick (of the Nonpareil or Moler type). This may with advantage be further backed by magnesium slabs or asbestos board. When this practice is followed, care should be taken to see that the furnace arch is well supported, otherwise the lateral thrust may compress the magnesium slabs, with consequent fracture of the arch.

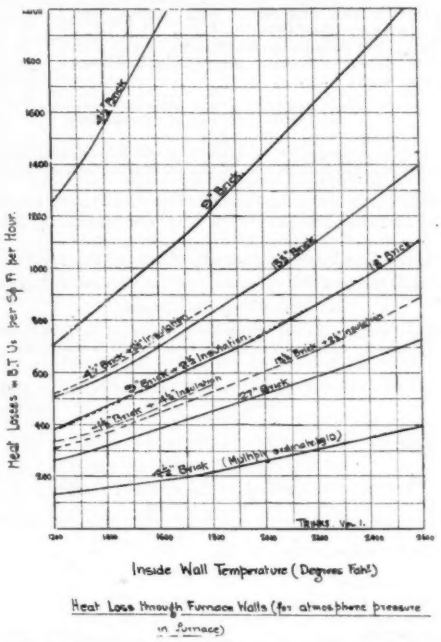

4½" Brick
9" Brick
13½" Brick
18" Brick
4½" Brick, 4½" Insulation
9" Brick + 4½ Insulation
13½" Brick + 4½ Insulation
13½" Brick + 2½" Insulation
22" Brick
4½" Brick (Multiply ordinate by 1/10)
Heat Losses = B.T.U. per Sq. Ft. per Hour
Inside Wall Temperature (Degrees Fahr.)
Heat Loss through Furnace Walls (for atmosphere pressure in Furnace)

Fig. 2.—Effect of Insulation on Heat Losses through Furnace Walls.

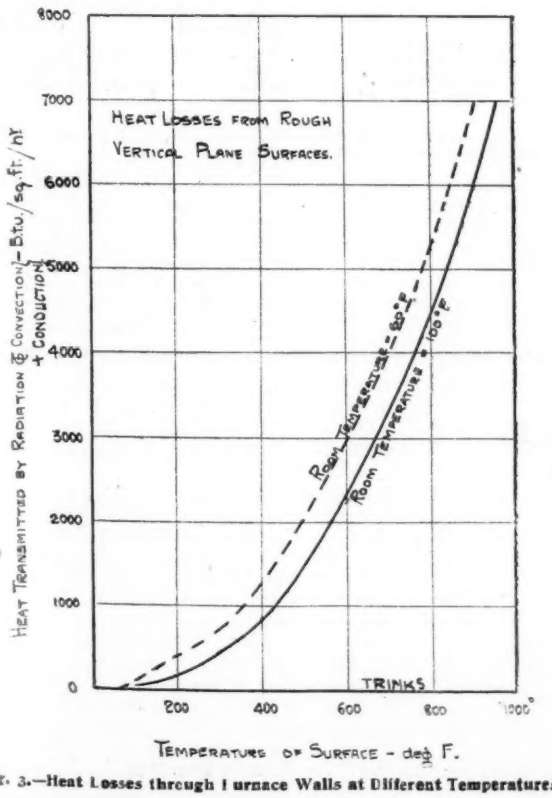

HEAT LOSSES FROM ROUGH VERTICAL PLANE SURFACES.
Room Temperature = 80° F.
Room Temperature = 105° F.
TRINKS
Heat Transmitted by Radiation & Convection + Conduction — B.Th.U./sq. ft./hr.
Temperature of Surface - deg. F.

Fig. 3.—Heat Losses through Furnace Walls at Different Temperatures.

Fig. 2 clearly shows the value of proper furnace wall thickness and construction.

Fig. 3 shows the heat losses by radiation, conduction, and convection from a vertical surface—*e.g.*, the sides of a furnace. The losses through the furnace top due to convection are more than for the sides, and the losses through the bottom are less.

RECUPERATION AND REGENERATION.

Hot flue gases are responsible for serious loss of furnace efficiency. This loss can be reduced to a minimum by transfer of the heat contained by the outgoing flue gas to the incoming air required for combustion. This transfer not only returns sensible heat to the furnace which otherwise would be wasted, but also reduces the specific gravity of the air, which enables it to mix more thoroughly and quickly with the gas. The speed of mixing is important, as it has considerable influence on the speed of combustion, which, of course, affects flame temperature. High flame temperatures are important, as the rate of heat transfer from the hot gases to the work and the furnace is governed by the difference in temperature between the gas and the work.

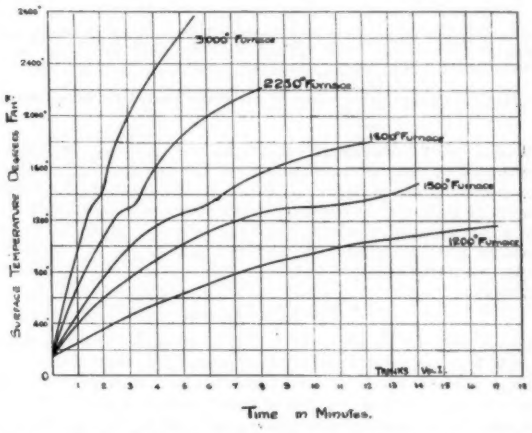


Fig. 4.—Time required to heat Bars, at Varying Furnace Temperatures.

Fig. 4 illustrates this point. It shows the relative time taken to heat up a 1-in. diameter bar at different furnace temperatures.

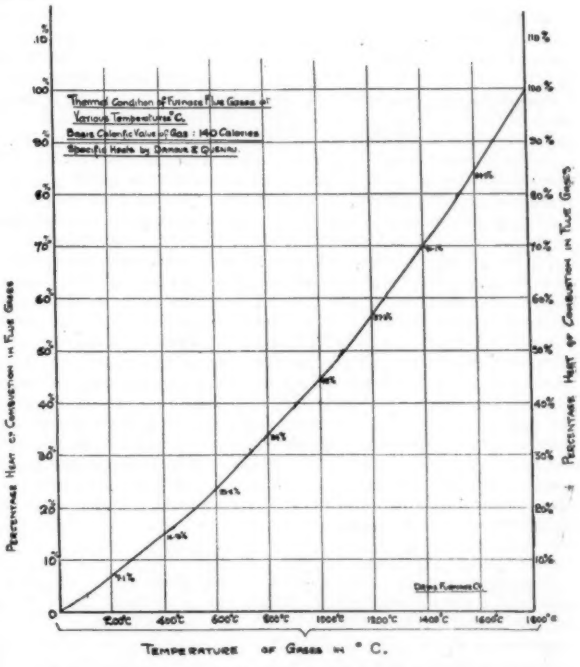

Thermal Condition of Furnace Flue Gases at Various Temperatures C.
Specific Heats by Dannon & Guenau
Percentage Heat of Combustion in Flue Gases
Temperature of Gases in ° C.

Fig. 5.—Heat Losses by Flue Gas at Various Temperatures.

Fig. 5 is drawn from information published by the Davis Furnace Company, and shows the percentage of heat of combustion contained in flue gases at various temperatures. If we take an air-blast gas furnace with gases leaving the flue at 1250° C., we see that 60 p.ct. of the heat generated is lost, whereas, if the flue gas temperature is by efficient recuperation reduced to 200° C., the loss is only 7 p.ct.

Fig. 6, compiled from the same source, shows the recuperative value of air when the total amount required for combustion is heated by the flue gases to various temperatures.

Figs. 5 and 6 indicate theoretical conditions; but there is no reason why they should not be approached in practice. The very low flue-gas temperatures cannot, however, be absolutely attained, partly owing to the loss of the latent heat of the moisture contents of the flue gas which finally leaves the furnace in an uncondensed state.

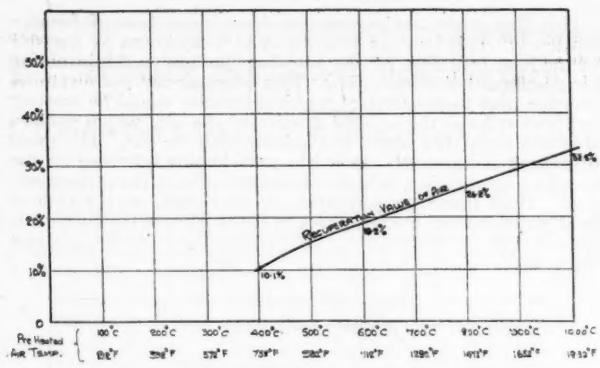


Fig. 6.—Recuperative Value of Air when heated by Flue Gases.

While air recuperation offers the most scope for effecting economies in gas furnace operation, the pre-heating of the gas also helps to some degree. With town gas the advantage gained in this way is comparatively small, owing chiefly to the low gas-air ratio required for combustion; but in the case of producer gas, where nearly as much gas as air is required for proper combustion, pre-heating shows a decided increase in efficiency.

Furnace Doors.

The doors, which often fit badly, account for a large amount of heat lost; the insulation being, as a rule, very thin.

They should be of robust construction, well provided with insulation, and large enough to cover fully the furnace opening and make a virtually gas-tight joint with the furnace front when shut and clamped-up. The weight and bulk of a substantial door are no detriment if a balanced quadrant and operating lever be provided, instead of the more usual chain and weight, which, even with a light door, is anything but "handy."

A New Annealing Furnace.

With the object of reducing the cost of pot replacements and also the cost of fuel used per unit of work produced, and at the same time of increasing the output, a new type of continuous bright annealing furnace has recently been put on the market. I have had an opportunity of testing and observing the performance of one of these furnaces (made by the Lucas Furnace Company) for the last fourteen months or so. It was designed for close annealing bright steel pressings for the motor and cycle trades, and was put in competition with two other gas-fired furnaces of high efficiency and repute. In both cases full advantage was taken of air recuperation and proper insulation. After one or two modifications to the furnace, the claims made have been fully justified. Clean bright work can be produced, thick heavy pots have been eliminated, the labour cost has not been increased, the output per furnace has been in most cases doubled or trebled, and the gas consumption per pound of metal treated has been reduced by 50 p.ct., and in some cases by 66 p.ct. Further experiments are being made, which, I am convinced, will have the effect of reducing the gas consumption still more. The time elapsing between the components leaving and returning to the press shop has been reduced by over 50 p.ct., which will enable a larger output to be obtained with less floating stock; the machine is easily managed by semi-skilled labour; and the quality of output is satisfactory. Rusty work can be put into the furnace and brought out practically clean without extra cost.

Running Costs of Furnaces.

I propose to give a few figures as to the comparative costs of running a few furnaces of different makes and types under actual manufacturing conditions; the object of this being to impress on the engineer some of the advantages he may expect to gain by giving the same close attention to the selection and running of his furnaces as he does to his machine tools. In the following tests all the furnaces are by makers of wide repute, and were supplied for the class of work upon which the tests were conducted. The majority of the furnaces are run continuously day and night during the working week, and the tests were all of several hours' duration. It is not claimed that the results are particularly good. The tests were carried out in order to compare the various makes and types of furnaces under normal working conditions. The furnaces grouped together for comparison are similar in size, and the work done is the same. Other conditions were as nearly as possible the same.

Table I. gives the comparative gas consumption of various furnaces used for re-heating work after carburizing.

Table I.—*Reheating after Carburizing.*

Furnace.	C.Ft. of Gas per Lb. of Metal Heated.
1. American forced-draught, under-fired	5·92
2. British fan draught, recuperative	2·56
3. British natural draught, regenerative	2·44

Table II. gives the gas consumption of various furnaces on carburizing.

Table II.

Furnace.	C.Ft. of Gas per Lb. of Net Useful Load Heated.
1. Reverberatory, natural draught	56
2. Forced draught, under-fired with flat roof	88·5
3. Forced draught, under-fired with arched roof. Roof slightly lower than No. 2	53·5
3a. As No. 3, but with better insulation	42
3b. As No. 3a, with air heated to 175° C. by flue gases	35·7*
4. Regenerative	29·5†

Gas per lb. gross load, 15 p.ct. of above.

* Saving of 33⅓ p.ct. over No. 3

† Slightly larger furnace than the above, holding larger load.

NOTE.—Weight of carbonizing boxes and material not included as useful load.

Table III. gives the costs of running the bright annealing furnace and the ordinary type of close annealing furnace.

Table III.—*Comparative Running Costs of the Bright Annealing Furnace and Modern Recuperative or Regenerative Furnaces under Working Conditions.*

CONDITIONS: **Full load over extended periods on various classes of steel pressings requiring to be close-annealed without scale.**

Work.	Standard Types of Furnace (Regenerative or Recuperative).		Bright Annealing Continuous Furnace.	
	No. per Hour Output.	Gas Consumed per Lb. of Metal.	Output per Hour.	Gas Consumed per Lb. of Metal.
		C.Ft.		C.Ft.
A. Light bulky components	210	14·9	480	4·26
B. Light smaller components	108	10·1	200	3·49
C. Medium small components	72	11·2	120	4·26
D. Heavy larger components	25	8·13	36	3·6
	Average =	11·1 c.ft. per lb. of metal annealed	Average =	3·73 c.ft. per lb. of metal annealed
Hourly running cost, including pot wastage and miscellaneous stores	23d. for 67·6 lbs. of metal 0·34d. per lb.		16·36d. for 129 lbs. of metal 0·126d. per lb.	

[Since the above tests, this has been reduced, but it is early yet to say how far the reductions will be permanent.]

The labour costs were the same in both cases; but if two bright annealing furnaces had been available, the labour cost on same would have been reduced by 50 p.ct. Also, there is no doubt that the thermal efficiency of the bright annealing furnace can be improved by better insulation and better means of ensuring complete combustion of the gas. The gas used per lb. of metal annealed is for the net amount of useful work produced; the weight of the pots is not included as useful load.

"Vertical Retorts."—At the next meeting of the Junior Institution of Engineers, to be held at No. 39, Victoria Street, S.W., on Friday (April 17), a paper on "Vertical Retorts," illustrated by lantern slides and models, is to be read by Mr. Walter T. Dunn, M.I.Mech.E.

Iron and Steel Institute.—The annual meeting of the Institute is to be held at the Institution of Civil Engineers, Great George Street, S.W., on Thursday and Friday, May 7 and 8. Sir Frederick Mills, Bart., will deliver his Presidential Address, and a number of papers will be presented. Members will dine together at the Hotel Cecil on the Thursday evening.

Seventy-Five per Cent. Waste.—In the speech of Mr. H. James Yates at the annual meeting of Radiation Ltd., as reported in the "JOURNAL" for April 1, there was a printer's error in the paragraph headed "The Smoke Problem." Mr. Yates was made to say: "When coal is burned in its crude form in an ordinary coal grate, the direct waste of fuel is estimated at 5 p.ct." It will have been obvious to most of our readers that the "5" should have been "75."

THE GAS INDUSTRY IN NEW ZEALAND.

[A few extracts from the Presidential Address delivered by Mr. James Lowe, M.Inst.C.E., Manager and Engineer of the Auckland Gas Company, Ltd., at the First Annual Meeting of the Gas Institute of New Zealand.]

The density of population in our cities and towns is much less than in the Homeland. This arises from the practice of building—except in principal streets—houses of the detached type on sections usually not less in size than a quarter of an acre. This practice, while it has many advantages, is the cause of a greater expenditure on mains than might otherwise be necessary. The incidence of the cooking load also is different from that in Britain. The chief meal of the day for all classes of people is taken in the evening; and in winter the peaks of the lighting, heating, and cooking loads overlap between five and six o'clock. In fact, the incidence and nature of the cooking load as compared with lighting tends to increase the capital expenditure, per 1000 c.ft. of gas sold, on mains. However, by means of high-pressure distribution superimposed on a low-pressure reticulation system, great economies can be made in the cost of mains in a growing district.

Gas Engineers Their Own Contractors.

Gas engineers and managers in the Dominions have to rely on themselves to a much greater extent than their confrères at home have to do. There are practically no firms within easy reach who specialize in the manufacture of gas plant available. In consequence, the engineer has not only to prepare plans, specifications, and detailed estimates of much of his plant, but in addition has frequently to do the fabrication and almost invariably the erection with his own staff. For this reason the larger gas-works in the Dominions are equipped with workshops and appliances on a scale exceeding that to be found in similar-sized works in Britain, where there is a much greater dependence on contractors for repairs, as well as for new work. One result of the war has been to encourage the manufacture of plant in the Dominion.

It takes at least five months—often much longer—to receive goods from Britain after ordering by mail; and it is necessary for New Zealand gas engineers and managers to look well ahead with their requirements. They must devote some little attention to the matter of indenting, for it is a serious matter to run short of essential things, the absence of which would seriously interfere with the manufacture or supply of gas.

Effects of Freight Insurance Tariff.

The facts that we are from twelve to thirteen thousand miles away from the manufacturers, and that New Zealand possesses a Customs Tariff, add considerably to the cost of our imports. The costs of freight, insurance duty, wharfage, &c., have to be added to the home cost, so that on the average we have to pay from 40 to 50 p.ct. more than our confrères in Britain for all goods we import. Rates of wages also are higher in the Dominion than they are in Britain. These conditions, together with the greater cost of coal, explain why gas prices must be higher in the Dominion than they are in Britain.

Unfair Competition.

The gas industry has to face competition from power boards supplied with electricity from State hydro-electric works. The Government are spending huge sums on these schemes, and are subsidizing them in various ways. The power boards are required to pay neither income-tax nor local rates, and deficits are made good from the general revenue of the State. In addition, they receive indirect subsidies through the Customs, since "all machinery and appliances peculiar to the generation of electricity," including electric motors, cables, insulators, &c., are duty-free, while gas and steam engines are charged 10 p.ct duty, and cast-iron pipes above 9 in. diameter and steel pipes above 6 in. diameter 20 p.ct. duty. It is only fair to say, however, that machinery for any manufacturing purposes is now admitted free of duty provided it can be shown to the satisfaction of the Minister of Customs that the same could not have been economically manufactured in New Zealand.

Labour Legislation.

Perhaps the most uncongenial duties which fall to the lot of gas-works engineers and managers in New Zealand are those in connection with industrial disputes. The Industrial Conciliation and Arbitration Act of 1908 and the Labour Disputes Investigation Act of 1913 are probably the most advanced labour legislation in the world. Under these Acts the maximum term for which awards and agreements can be made is three years, but in practice the award or agreement is almost invariably fixed for a term of two years. Disputes are therefore automatically created in every trade or class of labour every two years. The workers' Unions are nearly always the applicant parties, and they draw up and serve on employers schedules of demands which are not usually characterized by moderation. Shorter hours, higher wages, increased rates for overtime, extra pay for certain classes of work, &c., are usually demanded.

Employers have then to draw up counter proposals, and to spend much time in Conciliation Council or at the meetings of a Labour Disputes Committee. These meetings sometimes continue for a fortnight; and when no settlement is reached, the dispute goes to the Arbitration Court if under the Industrial Conciliation and Arbitration Act, or to a vote of the workers as to whether they will strike or not, if under the Labour Disputes Investigation Act.

Gas engineers and managers in New Zealand have to devote to labour matters much more time than have their confrères in Britain.

Coal.

The only bituminous coals in the North Island are found in the neighbourhood of Whangarei, about one hundred miles north of Auckland, but these coals are not used for gas manufacture, on account of their high content of sulphur, which is about 4 to 5 p.ct. The chief coalfield in the North Island lies about 100 miles south of Auckland in the valley of the Waikato, and is an excellent lignite. Unfortunately its yield per ton is only about 10,000 c.ft. of gas having a calorific value of 400 B.Th.U., or 40 therms. The coke is exceedingly friable, light, and difficult to quench. Needless to say, this lignite coal is not much used for gas manufacture. In Auckland we—in common with the other New Zealand gas-works—draw our principal coal supplies from the Maitland coalfield of New South Wales and from the West Coast mines of the South Island of New Zealand.

A comparison of prices of coal delivered into the Auckland Gas-Works in 1913 and 1924, together with the prices charged for gas, is of interest:

Year.	Coal.		Gas.		Income-Tax.	
	Cost per Ton.	P.Ct. Increase.	Price per 1000 C.Ft.	P.Ct. Increase	Rate per £1.	Pence per 1000 C.Ft.
	s. d.		s. d.		s. d.	
1913 ..	22 4	..	4 3	..	1 2	0·68
1924 ..	42 9	93	7 6	76	5 10	6·02

The Auckland Gas Company, Ltd.

The memorandum of the Association of the Company is dated July 23, 1862. On April 15, 1865, gas was supplied for the first time. The output in 1866 was 6,755,000 c.ft. and the price 20s. per 1000 c.ft. In 1924 the output was over 1302 million c.ft. Altogether there are 463 miles of low-pressure reticulation and 48½ miles of high-pressure mains ranging in size from 18 in. to 3 in. For low pressure, ordinary cast-iron mains with cast lead joints are used; for high pressure, wrapped and coated steel tubes with long rigid joints are preferred. The manufacture of firebricks and retorts as a branch of the Company's business was begun in 1884.

Warner Low-Temperature Retort.

The Economic Carbonization Company are completing at Petersburg (Va.) an installation of four retorts of commercial size designed and patented by Mr. A. W. Warner, which, it is stated by Dr. Horace C. Porter, in a paper submitted to the Franklin Institute, on "Low-Temperature Coal Carbonization and Its Prospective Industrial Development," will utilize the principle of withdrawal of the volatile matter chiefly in a direction away from the source of heat. The retorts are vertical, made of metal (of special heat-resisting alloy in the top section), and heated in a setting of gas-burning flues. These flues provide higher heat at the top of the retorts, and lower at the bottom. Within each retort is a worm conveyor propelling the coal upward; and through the hollow shaft of this worm the gases are drawn-off. The feed of coal is so designed that it meets the off-coming gases and vapours, cooling them and setturning the condensed heavy oils with the coal into the retort. It is claimed by the inventor that the condensates, since they bear no free carbon or pitchy residues, will not clog the outlets. The minimum capacity of this retort is set down at 10 tons per day. The process is designed to produce a free-burning coke of not over 2 p.ct. volatile matter, a high yield of oils, a fair yield of ammonia, and about 8000 c.ft. of 750 to 800 B.Th.U. gas. The Petersburg plant is expected to operate commercially in conjunction with the local gas-works, and turn its gas into the city mains. It is a process wherein low-temperature carbonization is combined in an ingenious manner with certain features of high-temperature carbonization; and, he adds, its practical development is to be awaited with special interest.

Yorkshire Junior Gas Association.—Arrangements have been made for members to visit, on Saturday afternoon, April 18, the works of Messrs. J. Blakeborough & Sons, Ltd., in Birds Royd Road, Brighouse. Visitors will assemble at the works at 3 o'clock.

London and Southern District Junior Gas Association.—A meeting will be held at the Westminster Technical Institute, Vincent Square, S.W. 1, on Friday next, April 17, at seven o'clock, when Mr. Dean Chandler, of the South Metropolitan Gas Company, will read a paper entitled "Fuel in Industry."

CORRESPONDENCE.

[We are not responsible for opinions expressed by Correspondents.]

Spirally-Guided Flying Lifts.

Sir,—With reference to the two letters appearing in your last issues as to the patent of our Mr. William Blakeley, we would like to make it clear that, at the time of taking out this patent, we were not aware that any similar idea had been previously adopted.

In view of the evidence now put forward, we realize that, though the patent has been granted to us, we cannot object to those firms who, prior to the patent, had added spiral flying lifts of their own design to column-guided gasholders.

The system of spirally-guided flying lifts as designed by us and on our principle is, we submit, substantially stronger and safer than the ordinary method of flying-lift construction, and gives the same stability to the flying-lift as in the usual lifts of the ordinary spiral-guided gasholder.

Last year we constructed a new three-lift gasholder on this principle on the South Coast, which has proved very satisfactory, having stood without "flinching" the exceptional gales experienced at the end of last year, though fully inflated the whole time. Those who were residing on either the Kent or Sussex coast at that time will know what a severe test to a gasholder that occasion was.

Our firm have another gasholder in hand for a Southern works on the same principle. We contend that no independent engineer who thoughtfully studies our design can deny it is a far safer proposition than the ordinary type of flying lift.

For Firth Blakeley, Sons & Co., Ltd.,
H. Blakeley,
Secretary.

Church Fenton, via Leeds,
April 10, 1925.

REGISTER OF PATENTS.

Carbonization.—No. 228,763.

Rude, J., of Hyde Park, W. 2.

No. 12,681; May 23, 1924.

This invention is a development of that contained in specification No. 204,718. The latter relates to carbonization of solid fuel consecutively in an internally-heated low-temperature retort and an externally-heated high-temperature retort; the process consisting mainly in the utilization for carbonization purposes of the heat of the flue gases, which have served to heat the high-temperature retort externally, by leading them to a heat interchanger, where the gaseous fluid which, by its sensible heat, performs the low-temperature operation in the internally-heated retort, is heated.

In the original application, the gaseous fluid which performs the low-temperature operation, and the gases emanating from the externally-heated retort, meet and mix outside the retorts. According to the present invention, the two retorts are now arranged in such a way that their interiors communicate freely, and virtually constitute one apparatus comprising an upper and a lower retort, so that the fuel within them forms an unbroken column, the lower part of which is subject to external heating, and the upper part to internal. This communication of the retorts makes it necessary that the gases produced in the externally-heated part shall not be removed from the latter for the purpose of mixing them with the gaseous fluid destined for the low-temperature operation in the internally-heated part, but shall on the contrary be left to ascend freely through both retorts, so that the encounter of the gases from the lower retort and the gaseous heating fluid takes place somewhere in the interior of either of the two retorts.

The reason for the suggested modification is to make it possible to carbonize a fuel in lump form—for instance, coal briquettes, which, to avoid breakage, can pass consecutively through both retorts without meeting any obstructions on the way, which are inevitable if the gases from the lower retort are prevented from entering directly into the upper retort.

Another feature of the new invention relates to leading the gaseous fluid, which performs the carbonization in the upper retort by its sensible heat, through the hot coke in the lower part of the externally-heated retort, before the fluid enters the heat interchanger. The reason for this innovation is twofold. First, the contact of the gaseous fluid with the hot coke causes a conversion of the hydrocarbon vapours into permanent gases, and thus prevents a decomposition of the hydrocarbons from taking place later on in the heat interchanger, where cracking may interfere with its regular working. Secondly, the sensible heat of the coke is to a large extent transferred to the gaseous heating fluid and subsequently utilized for carbonization, the coke being at the same time cooled.

Dry Meters.—No. 228,795.

Cooke, A. G., and Phillips, B. C., both of Joymanco (Brighton) Limited, of Hove.

No. 19,304; Aug. 14, 1924.

(Patent of Addition to No. 207,072, Jan. 5, 1923.)

The parent patent was noticed in the "Journal" for Dec. 26, 1923. The measuring chamber is now modified by the rim having an annular recess stamped or swaged to the outer edge, being of a shape approximating to the form of a half-ellipse. A split ring is inserted over the removable diaphragm and mounted in the annular recess compressing the flexible material of the removable diaphragm at two separate positions, each being near the respective end of the swage in the rim and allowing the dressing oil in the flexible material to be retained between the compressed portions. An annular V or U shaped groove is formed in each of the discs of the diaphragm.

Ascension Pipes.—No. 229,863.

Mackenzie, M., of Ecclesfield, Sylvester, J., of Barnsley and Outwin, E., of Worsborough.

No. 5272; Feb. 29, 1924.

According to this invention, an ascension pipe comprises sections each provided with a plurality of openings at intervals in its length, adapted to be temporarily sealed. Conveniently these openings are provided with removable plugs, flap doors, or equivalent means whereby they may be temporarily closed; but if desired, they may be stopped with fireclay, &c. Preferably the openings are formed in bosses cast on the pipes, the axes of the openings being at an angle with the axis of the pipe.

The openings may be at uniform intervals along the pipe or closer together adjacent to the foot than elsewhere, where also they may be larger than the openings remote therefrom. Usually it will be found preferable to arrange adjacent openings in staggered relationship one with the other.

Normally, air will be admitted to the pipes through the openings for the purpose of burning out the deposit when the oven is taken off from the gas main and is awaiting discharge, the order of unsealing of the openings being preferably from the top toward the foot. The admission of air through several openings facilitates burning out the carbon; and the removal of the deposit may be further facilitated or accelerated by rodding.

Producers.—No. 229,891.

Regenerative Coal Gasification System, Ltd., Travers, M. W., both of Queen Victoria Street, E.C. 4, and Clark, W., of Lymm.

No. 8653; April 5, 1924.

This invention relates to gas-making plant as described in specifications Nos. 198,777 and 210,356 [see "Journal," Vol. 163, p. 312, and Vol. 165, p. 569, respectively].

According to the present invention, the patentees divide the carbonization chamber of the plant into compartments by means of vertical or substantially vertical partitions extending for part or for the whole of the distance from the top of the carbonization chamber to the nostril leading to the regenerator, so that the mass of coal is sub-divided. They find, especially in the case of large plants, that by such subdivision a better yield is obtained, as the coal undergoes a more uniform and more rapid treatment than is possible when there is a large undivided mass.

Testing Pipe Joints.—No. 229,991.

Ross, D., and Weiser, R. F., both of Newport, and The British Mannesmann Tube Co., Ltd., of Queen Victoria Street, E.C. 4.

No. 1316; Dec. 21, 1923.

This invention relates to pipe-testing apparatus of the type mentioned on p. 127 of last week's "Journal" as having been patented by the same claimants.

According to the present invention, the casing, which consists of a segmental split ring and a segmental closing member disposed in a gap arranged between the ends of the ring, is expanded by the instrumentality of a bolt which is connected at one end to a lug on the closing member and at the other end is adjustably housed in a socket formed in a lug on the ring, in conjunction with toggle mechanism comprising a collar slidably mounted on the bolt, toggle links pivotally connected with the collar and bearing against projections provided on the terminal portions of the ring, and means for moving the collar along the bolt.

Furnaces.—No. 230,125.

Gibbons Bros., Ltd., and Marle, M. V., both of Dudley, and Walter, C. M., of Birmingham.

No. 24,804; Oct. 5, 1923.

This invention relates to gas-fired furnaces in which chambers for preheating air and gas are located within the walls of an enclosed furnace and below the working chamber or chambers thereof; the preheating chambers being heated by the exhaust gases of the furnace. The object of the invention is to provide a more efficient and more easily controlled and regulated furnace.

According to this invention, the furnace comprises separate air and gas regenerative chambers adapted to be heated by contiguous chambers through which the exhaust gases pass, separate conduits leading to the burners, valves for controlling the air and gas between the chambers and the burners, gas ports in the burners, and separate air ports disposed laterally of the gas ports. The arrangement is such that the air issuing from the ports converges towards and mixes with the gas stream, prior to which the air has been maintained entirely separate from the gas.

In one construction a plurality of separate burners located longitudinally below the working chamber have each a central section delivering gas and two separate outer sections delivering air. The air preheating passages are arranged in two groups between three groups of exhaust passages, and one of the air sections of each burner is connected by a separate passage with one of the preheating groups, while the other air section of each burner is similarly connected with the other group of preheating passages.

In an alternative construction the air passes from a plurality of groups of air preheating passages into a common chamber, and conduits convey the air from the common chamber to a plurality of points near each side of the working chamber.

These forms of the furnace are fully described in the specification, in connection with 13 detail drawings.

Gas Taps.—No. 230,143.

Helps, G., of Nuneaton.

No. 30,048; Nov. 29, 1923.

The patentee says that "the main object of this invention, as indeed has before been proposed, is to utilize the pressure available

while a burner is called on to pass small quantities of gas, so that the flame may be produced always from a completely combustible mixture. The burner can be used in districts having different qualities and pressures of gas without alteration except bringing a different number of nipples into action."

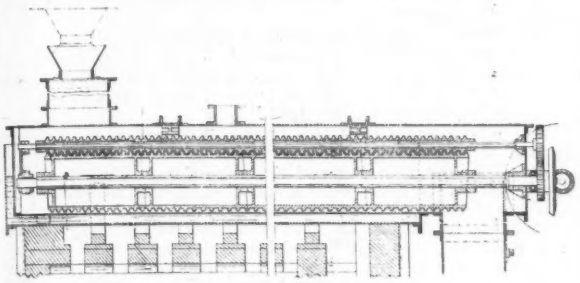
The plug on the barrel of the gas cock claimed contains a plurality of gas ways acting as nipples or provided with nipples injecting gas into a single burner; the arrangement being such that as the cock is opened or closed, one or more or all of the gas ways is or are brought into operation.

Heat Treatment for Distilling, Drying, or Carbonizing. No. 230,223.

"T.I.C." Research Co., Ltd., Duckham, Sir A. M'D., Rider, D., and Watts, J. S., all of Grosvenor Gardens, S.W. 1.

No. 1413; Jan. 17, 1924.

By this invention, which relates the heat treatment of materials for distilling, drying, or carbonizing them in a trough, retort, or the like heated by molten metal, it is claimed that the material is distributed in a comparatively thin layer over the heating surface by a device which both spreads the material as a layer and turns it over, and that in this manner practically every particle comes into contact with the heating surface during the process.



A "T.I.C." Retort.

It is pointed out that the invention is particularly applicable for the known method of subjecting coal which is to be coked to a preliminary low-temperature carbonization; also for the destructive distillation of shale, and for the distillation of tar oil until a coke residue is obtained.

We reproduce part of a longitudinal sectional drawing which accompanies the specification, omitting the oil-fired furnace and extractor shown in the original. A trough-shaped retort is set in a correspondingly shaped bath containing lead which is kept at the required temperature above its melting point by the oil-fired furnace. A shaft is mounted at one end in a bearing within the retort and at the other end in a bearing carried by the end of the retort. On it is fixed a left-hand screw-threaded cylinder (the conveyor) which is in mesh with a right hand screw (the spreader and scraper) of similar pitch and carried by a shaft mounted above the first.

PARLIAMENTARY INTELLIGENCE.

HOUSE OF COMMONS.

Progress of Bills.

Bills, as amended, considered, and to be read the third time: Barrow-in-Furness Corporation, Gas Light and Coke Company, Stockton-on-Tees Corporation.

Bill read the third time, and passed: Bolton Corporation.

The Standing Orders having been complied with, the Horley District Gas Company (Electricity Supply) Bill, and the Rochdale Corporation Bill are to be read a second time.

Gas Regulation Act.

In the House of Lords, on the motion of the Earl of Onslow (on behalf of Viscount Peel), the draft Special Order relating to the Gloucester Gas Light Company was agreed to. A similar motion was approved in the House of Commons on the proposition of Sir Burton Chadwick.

Copies were presented of drafts of Special Orders proposed to be made by the Board of Trade under the Act, on the application of the Brighouse Corporation, Pinner Gas Company, and the Yeadon and Guiseley Gas Light and Coke Company.

BARROW-IN-FURNESS CORPORATION BILL.

This Bill (see "Journal" for Jan. 21, p. 142) has been under consideration by the Local Legislation Committee of the House of Commons. The clause giving power to sell, let on hire, and maintain gas apparatus and fittings has been withdrawn by the promoters.

WESTMINSTER CITY COUNCIL (GENERAL POWERS) BILL.

This Bill was considered by the Unopposed Committee of the House of Commons (presided over by Mr. James F. Hope, Chairman of Ways and Means) last Wednesday, and ordered to be reported for third reading.

Originally, the Bill contained a clause enabling the City Council to construct subways; but petitions were deposited by the Gas Light and Coke Company, the Metropolitan Water Board, and Electricity Companies, on the ground of interference with their mains. Consequently the promoters withdrew the clause

MISCELLANEOUS NEWS.

IMPERIAL CONTINENTAL GAS ASSOCIATION.

Annual Report of the Directors.

The following is the report of the Directors for the year ended Dec. 31, which will be submitted to the proprietors at the 177th Ordinary General Meeting on May 13.

Of the agreed compromise in respect of the Association's German claims, a further instalment of 7s. 6d. in the pound on the outstanding balance has been received, and is incorporated in the accounts for 1924. The proportion of this instalment which represents realized accretion to capital, together with the undistributed balance of that account, amounts to £388,903 8s. 1d. The Directors recommend that this sum of £388,903 8s. 1d., being an accretion to capital which has been realized and turned into money, be dealt with as profit and applied in payment of a special dividend for the year 1924 at the rate of 19½ p.ct. per annum on the nominal amount of the issued capital stock of the Association, payable on May 26.

The profit for the year (inclusive of the revenue proportion of the German claim instalment) is £230,628 4s. 1d., which, together with the sum of £45,951 0s. brought forward from the previous year's account, makes a total of £276,579 10s. 1d. available for appropriation, out of which an interim dividend of 5 p.ct. (actual), less tax, amounting to £76,570 12s. 9d., was paid in November last. The Directors now recommend that, in addition to the 19½ p.ct. special dividend, there be also paid on May 26:

(*a*) A final ordinary dividend at the rate of 5 p.ct. (actual), less income-tax at 4s. 6d. in the pound, making the total ordinary dividend for the year 10 p.ct.

(*b*) A special bonus dividend, in celebration of the Association's centenary, at the rate of 5 p.ct. (actual), less income-tax at 4s. 6d. in the pound.

The sum of £46,867 11s. 10d. will accordingly remain to be carried forward to the next account.

The total output of gas in the towns supplied by the Association in 1924 was 5474 million c.ft., showing an increase at the rate of 5·3 p.ct. on the preceding year. The number of consumers on Dec. 31 last was 257,412, and shows an increase at the rate of 6¼ p.ct. in the year. The quantity of coal carbonized during the year under review was 316,200 metric tons, at an average gross cost per ton delivered on to the works of 27s. 2d., or 1s. 3d. per ton more than in the preceding year. The Droogenbosch electricity works at Brussels sold, during 1924, 21,574,759 KW.H., as compared with 16,031,129 KW.H. in 1923, an increase of 5,543,630 KW.H., or 34·58 p.ct. On Dec. 31, 1924, 1425 miles of gas mains and 547 miles of electric cables were in use, as compared with 1378 and 264 miles of mains and cables, respectively, on Dec. 31, 1923.

At Antwerp contracts giving the Association a gas monopoly until 1959 were concluded with the Communes of Halle (1060 inhabitants) and Merxplas (3067 inhabitants). At Brussels prolongations of contract for the supply of gas and electricity were secured at Linkebeek (3322 inhabitants) until 1945, at Uccle (35,755 inhabitants) until 1953, and at Woluwe-St.-Pierre (9917 inhabitants) until 1954. New contracts for the supply of gas and electricity were also concluded with the Commune of Schepdael (2234 inhabitants) until 1963, and with the Communes of Gaesbeek (376 inhabitants), Lennick-St.-Martin (1708 inhabitants), Lennick-St.-Quentin (2824 inhabitants), Lombeek-Ste.-Marie (709 inhabitants), Strijthem (847 inhabitants), and Wambeek (1782 inhabitants) until 1964.

At Antwerp the erection of three new naphthalene washers on the Berchem Works was completed. On the Hoboken Works the foundations of a new water gas plant were finished, and good progress was made with the erection of four new purifiers. A waste-heat boiler for the horizontal furnaces was also put into action with satisfactory results. Owing to the growth of business, the accommodation at the Cappellen District Office, near Antwerp, was found to be inadequate, and an additional plot of land was acquired. Moreover, in order to facilitate railway connection with the Association's site at Schooten, north-east of Antwerp, a strip of land was purchased there.

At Brussels, the renewal of six settings of vertical retorts on the Forest Works was almost completed, and eight settings of horizontals on the Koekelberg Works were reconstructed. Good progress was also made with the enlargement of the Chaussée d'Ixelles offices. At the Droogenbosch central station the extension of the buildings to house the new boilers and generators was completed, and two new turbo-alternators, one of 3750 KW. and the other of 10,000 KW., were put into action. The installation of a second 10,000 KW. turbo-alternator was also practically finished.

The gas-works at Bruex (a town of 27,000 inhabitants in Czecho-Slovakia), which were purchased by the Association in 1898, were ceded to the Municipality on Oct. 1 last, in accordance with the terms of the contract.

The Board regret to announce the death, on June 26, 1924, of Mr. H. G. Newton, who had been a Director since March, 1906. To fill the vacancy thus caused, Mr. George Jessel, M.C., has been elected to a seat on the Board. The Directors who go out of office by rotation are Colonel H. LeRoy-Lewis, C.B., C.M.G., D.S.O., Mr. Robert William Wilson, and the Rt. Hon. Sir Guy Douglas Arthur Fleetwood Wilson, G.C.I.E., K.C.B., K.C.M.G. They are eligible for re-election, and offer themselves accordingly. The Auditor who retires is Mr. C. F. Dendy Marshall, who is eligible for re-election, and offers himself accordingly.

(Signed) C. J. Jessel,
Chairman.

HONG KONG AND CHINA GAS COMPANY, LTD.

Annual General Meeting.

The Annual General Meeting of the Company was held at the Offices, No. 148, Gresham House, Old Broad Street, E.C., on Monday, March 30—Mr. Robert H. Glen, F.C.A. (the Chairman), presiding.

The Secretary (Mr. A. C. Pullen) read the notice convening the meeting and the Auditors' report.

The Chairman: Gentlemen, a copy of the report and statement of accounts having been sent to all the shareholders, I will ask you to take them as read.

Before I pass on to our ordinary business, you will perhaps permit me to refer to the fact that to-morrow is the first anniversary of Mr. Phillips' death. We miss his presence, but continue to benefit by the wise direction he gave to our affairs in his lifetime. You will have learned from the report of Mr. Wardrop's resignation from the Board. This was a cause of much regret to the other Directors, who tried hard to persuade Mr. Wardrop from taking such a step. Mr. Wardrop felt, however, that the time had come for him to give way to a younger man, and that his health would not allow of continued strain. The Board invited Major Heriot R. Glen, M.C., to fill the vacancy; and I will only say of him that he brings to our counsels keen business insight, as well as his lifelong family connection with the Company.

I referred last year to the fact that considerable additions had been, and were being, made to public lighting by gas in Hong Kong, and that our Engineer was trying hard to get back some of our lost lighting trade. I am sure it will be of interest if I mention the following figures for lighting appliances sold, supplied on hire purchase, or sent out on loan during the past year, exclusive of material for public lighting: "Surbiton," "Esher," "Pyrol," and other burners and lamps sold outright or on hire purchase, 911; supplied under the loan system, 1555. We also sold outright or on hire purchase 367 cookers, grillers, geysers, rings, &c., and supplied on loan 1040. It is a fact that the Company sold more gas stoves in six months of 1924 than in the previous six years. The Company have showrooms at Hong Kong Works, Kowloon Works, and at Messrs. Lane Crawford's, also a shop in the Wanchai district. We are negotiating with one of the largest Chinese firms in the Colony for them to exhibit our wares and help to push for gas business among the Chinese, who are large potential customers for the Gas Company.

The sales of gas increased at Hong Kong by 8·16 p.ct. and at Kowloon by 20·38 p.ct.; and I would like to emphasize to you that our private lighting trade went up by 10·16 p.ct. and public lighting by 11·29 p.ct. For years past we have endeavoured, from this side, to do all that was possible to retain and extend our gas lighting in Hong Kong; but you, as well as I, know that many people were obsessed with the idea that gas for lighting was either dead or dying. If this view was, and is, held, even by people in this country, you will, I think, agree with me that our present Manager is doing well in this branch of our trade at such a place as Hong Kong. Although Kowloon continues to develop, we are a little disappointed that our trade there has not made greater strides. At the present time a carburetted water gas plant is on order, and should be in operation before the end of this year to cope with the growing business. We have spent a good deal of money at Kowloon during the past five years—from 1920 to this date, about £45,000—but the Board feel sure this expenditure will bring good results.

The Directors were pleased to mention in their report that the cost of coal will show a large diminution for 1925. For some years we have considered the question of sending English coal to Hong Kong, and at the end of 1921 we had a cargo actually on order; but, after drastic reductions in the price of Yubari had been forced from this side, the cargo of English coal was cancelled. However, the advisability of trying good-class English coal has since been constantly before the Board, and during 1924 we made an experiment with 1500 tons of Yorkshire coal. The results obtained were, on the whole favourable, and a full cargo was sent out early this year. We have, in addition, contracted for Yubari coal to be supplied during 1925 at a very favourable rate. Indeed, I may say that four years ago it was costing us 100 p.ct. more than the price of to-day. I assure you, Gentlemen, that very strenuous endeavours have been made in this question of coal—one which is so vital to our Company.

Reference to our accounts will show that we have made additions to capital amounting to £8521, about one-half of which is for mains and services. We carbonized 1314 tons more coal in 1924 than in the previous year, and the extra cost for carburetted water gas is explained by the total output of it being one-third higher. Maintenance of retorts shows a considerable increase over 1923, accounted for by work done at both Hong Kong and Kowloon. The item in the balance-sheet for material used on vertical settings—viz., £3410—we propose to charge to revenue during the next three years. Other revenue debits show increases in consequence of larger trade, &c. Gas rentals advanced from $428,368 to $483,565—an increase of $55,107; and the figures for residual products total $68,922, as compared with $57,615. The estimated value of coke used on the carburetted water gas plant is credited here, our sales of coke really being very small. I mentioned last year that the Board were continually considering matters relating to our coke sales. At present our coke is disposed of entirely through the hands of a local contractor; but this has proved an unsatisfactory method, so the Company are at present engaged in trying to get the arrangement modified and, in due course, abolished. We hope, at no distant date, to be able to improve on the results shown. The amount of £1050 charged in the net revenue represents the vote made by you to Mr. Phillips' Executors for engineering work carried out by that gentleman over a course of twenty years, and the expenses connected therewith. I do not think further comment is needed on our accounts. The balance of net revenue amounts to £53,947, and a dividend for the year of 10 p.ct., free of income-tax, is recommended, less the interim dividend of 5 p.ct. paid in October, 1924.

The question of the purchase of our undertaking remains in *status quo*. Since the offer was received, our business has grown very much indeed; and I think our accounts for last year fully justify the line which the Board have taken in this matter, after prolonged and careful consideration. We hope for, and expect, far better results in 1925. If another offer for purchase is received, which is more in line with the value of our business and our properties, the Directors will place it before the shareholders.

Our Manager (Mr. Blackburn), in circumstances of considerable difficulty, has fully merited the confidence placed in him by the Board, and he is ably seconded by the other members of the staff. As from Jan. 1, the Board have inaugurated a bonus on profits scheme, by which all the local staff and workpeople will benefit, from the Manager to the lowest workman. A provident scheme has also been instituted, and to this all the European members of our staff have signified their intention to contribute a portion of their pay. Before I conclude, I may mention that my colleagues on the Board have requested me to visit Hong Kong again, in order to deal with some important outstanding matters. I leave for the East immediately. With these remarks, I have pleasure in moving that the report and accounts be received and adopted.

Mr. Strachan C. Clarke seconded the resolution, which was carried unanimously.

The Chairman moved the following resolution:

> "That a dividend at the rate of 10 p.ct. per annum, free of income-tax, be declared for the year ended 31st December, 1924, less interim dividend paid 1st October, 1924; the warrants to be made payable on the 9th April."

This was seconded by Major Heriot R. Glen, and unanimously carried.

The Chairman then proposed the re-election of Mr. Strachan C. Clarke as a Director of the Company, which was seconded by Mr. Leonard Askew, and carried unanimously.

In returning thanks, Mr. Clarke referred to the many problems with which in recent years it had been necessary to deal, and stated that he believed the Company had a prosperous time now before them.

Mr. John G. Wardrop moved the re-election of Messrs. Cash, Stone, & Co. as Auditors for the current year.

This was seconded by Mr. John M'Cubbin, and carried unanimously.

The Chairman proposed a vote of thanks to the staff in Hong Kong and London, which was seconded by Mr. John M'Cubbin, and, after being warmly supported by Mr. John G. Wardrop, was unanimously carried.

The Secretary responded; and the proceedings terminated.

GAS REGULATION ACT APPLICATIONS.

The following notice has appeared in the "London Gazette" regarding an application to the Board of Trade under the Gas Regulation Act.

SPECIAL ORDER.
Croydon Gas Company.

Application is to be made by the Company for an Order under section 10 to enable them to acquire scheduled land for gas-works purposes; to raise additional capital; to make further provisions with regard to the supply of gas; and for other purposes.

HAYWARD'S HEATH DISTRICT GAS COMPANY.

The Annual General Meeting of the Company was held on Friday, April 3—Mr. E. C. Charleton, Chairman, presiding.

In the report for the year ended Dec. 31, it was stated that the balance of the profit and loss account was £6267. It was proposed to pay a final dividend at the rate of 7½ p.ct. per annum on the 5 p.ct. consolidated stock for the half-year to Dec. 31, making 7½ p.ct. (less income-tax) for the year. The balance to be carried forward was £4242.

The Chairman, in moving the adoption of the report and accounts, said that the total quantity of gas sold during the year was over 77 million c.ft.—an increase over 1923 of 11·8 p.ct. During the year the price of gas had been reduced by 1d. per therm. Rental of meters and fittings showed a satisfactory increase. The Directors had placed a further £500 to the contingency account, bringing it up, with reserve, to the satisfactory figure of £4200. The repairs suspense account had also been added to, to the extent of £500. Negotiations which had spread over a number of years in a rather desultory manner with the Cuckfield Gas Company, for the purchase of the latter's undertaking, reached a satisfactory conclusion; and a purchase figure was agreed upon. The undertaking was taken over on Jan. 1, 1925. The satisfactory results obtained by their Company were due to a large extent to the ability of their Engineer, Manager, and Secretary, Mr. A. E. Whitcher.

At the conclusion of the annual meeting an extraordinary general meeting was held for the purpose of passing resolutions authorizing the Directors to raise a sum not exceeding £23,500 by the issue of debenture stock.

The Chairman, in moving the resolution, said it was only right that they should pay by capital for the Cuckfield Company; and as they had to supply Cuckfield, it would be necessary to erect another gasholder.

The resolution was carried.

The Hereford City Council have approved of a recommendation of the Gas Committee to borrow the sum of £3500 for the purpose of installing prepayment supplies.

LONDON COUNTY COUNCIL AND THE PRICE OF GAS.

At last week's meeting of the London County Council—Captain O. E. Warburg (Chairman) presiding—Mr. M. H. Davis (Whitechapel and St. George's) asked the Chairman of the Public Control Committee the following questions:

Commercial Gas Company.

(1) Whether his attention has been called to the fact that the Commercial Gas Company intend increasing the price of gas supplied by them, as from Lady Day, by as much as 2·85d. per 1000 c.ft., thereby bringing the price of their gas to as much as 3s. 8·65d. per 1000 c.ft.?

(2) Whether he is aware that one of the remarkable reasons given for the increase is that the price obtainable for coke has dropped?

(3) In view of the fact that the area supplied by the Company includes a large number of poor people, who will be severely hit by such increase, will he state what steps the Committee intend to take in the matter?

Mr. Cyril H. M. Jacobs (Clapham), the Chairman of the Public Control Committee, said in reply:

(1) The answer to the first question is in the affirmative.

(2) The increase is stated to be due to a reduction in the prices obtainable for residual products (coke, tar, and ammonia), and to increases of wages. The same reasons have been given by other gas companies for increases of price to be made as from Lady Day. There is nothing remarkable in the reasons given for the rise in price, as, owing to the increased production in the mining areas of France and Germany, a drop in the price of coke has actually occurred.

(3) The Council in 1924 made an application to the Board of Trade under the Gas Regulation Act, 1920, for the reduction of the standard price of gas applying to the Commercial Gas Company, in view of the fall in cost of production in recent years; and the standard price was accordingly reduced, as from June 30, 1924, from 15·4d. per therm to 11·4d. The effect of this reduction was that the authorized dividends payable by the Company were considerably reduced. The Company are within their statutory rights in increasing the price of gas, and no further action by the Council is possible in the present circumstances. By means of the sliding-scale, however, the interests of the shareholders are identified with those of the consumers; and the present increase in price will automatically involve a reduction of the dividends payable for the current year.

Mr. Davis: Can I ask the Chairman of the Public Control Committee when the increase in the wages of the workmen will take place?

Mr. Cyril Jacobs: I cannot answer that question. I do not know.

South Metropolitan Gas Company.

On the presentation of the report of the Public Control Committee relating to the South Metropolitan Gas Company's basic price, which was reproduced on p. 131 of the last issue of the "Journal,"

Mr. J. D. Gilbert, D.L., J.P. (Central Southwark), said he wanted to raise a point as to whether anything further could be done beyond what was reported by the Committee. It was reported that the South Metropolitan Gas Company were increasing the price of gas from 8d. to 8¾d. per therm. To the small consumers, and to a great many of the consumers who used the slot meter, he believed this would work out at an even higher rate than the 8¾d. per therm. He would like to ask the Chairman whether, in conjunction with this report, he had had any report as to the great slump in the price of coal which had occurred during the last fortnight. The price of coal had slumped very considerably—almost as much as from 3s. to 4s. a ton in some cases—and in view of this he would like to ask the Committee to consider whether the Gas Company were entitled to increase the charge for gas to the price they now proposed. There was a general impression outside the Council that there was some kind of appeal from a gas company's prices to the County Council. From this report, he did not gather that the Committee had dealt with that matter. Was there any method by which consumers could have the right of appeal to the Council as to whether the prices charged, not only by this particular Company, but by all other gas companies in London, were right and legal? If it was so, he thought it would be found that a good many consumers in South London would take advantage of the opportunity to come to the Council to know whether the Company were entitled to make this extra charge.

Mr. Cyril Jacobs replied that perhaps it would be well if he explained the different position of the South Metropolitan Company from that of other large companies who supplied in the London area. Whereas the South Metropolitan Company came under their own Act of 1920, all the other companies came under the Gas Regulation Act of the same year. At the instigation of the Council, applications were recently made to the Board of Trade for a revision of the standard or basic price in respect of the four largest Companies. The case of the South Suburban Gas Company was under consideration at the present moment. As a result of inquiries made by the Board of Trade, the standard price in pence per therm was reduced in each instance, as follows:

	Pence per Therm.
Gas Light and Coke Company . . .	from 15·2 to 11·0
Commercial Gas Company	,, 15·4 ,, 11·4
Wandsworth Gas Company	,, 16·6 ,, 14·0
Brentford Gas Company	,, 17 8 ,, 14·0

It would be noticed that the lowest standard price was fixed in respect of the Gas Light and Coke Company in 1924, and that this price was 11d. per therm. Under the South Metropolitan Gas Act of 1920 the standard price was fixed by Parliament at 11d. per therm—exactly the same as the lowest price fixed by the Board of Trade, in respect of the Gas Light and Coke Company—and in that Bill the Council had the right to go to Parliament in the present session to ask for a revision of the standard or basic price.

Mr. Gilbert: The Council or the Company?

Mr. Jacobs: The Company have to go, and the Council have a right to contest it. Continuing, he said that the Comptroller had conducted a very full inquiry into this question, which had been the subject also of a special meeting of the Public Control Committee. It appeared desirable that the statutory basic price should be brought into line with present costs; and action was being taken with a view to effecting this in connection with the Company's Bill now before Parliament. At Michaelmas, 1922, the South Metropolitan Company were charging 11¼d. per therm for their gas, but by Michaelmas, 1923, had reduced it by various stages to 8d. The Company were now giving notice of an increase of price by ¾d. per therm, and one could presume that this was to make income balance with expenditure. The Commitee were advised by the Council's officers that in their opinion the Company were quite justified, in the present circumstances, in making this increase. The price of gas must always be determined by the cost of production, and—another very important point—by the prices obtained by the sale of coke and other bye-products from the manufacture of coal gas. They had been told that there was going to be an increase in wages; and he understood that this was going to take place from the 1st of next month. It had been established that these Companies were receiving very much lower prices by the sale of their coke and other residuals, owing to the increase of mining and trade developments in France and Germany. He thought they must therefore be prepared for a general small increase in the price of gas in the near future. The interests of the consumers were adequately protected by the sliding-scale, under which the dividends payable were limited to a fixed figure so long as the price charged for gas was not less than the standard price fixed by Parliament; and the payment of any additional dividends must be accompanied by a proportionate reduction in the price charged for gas. By means of the sliding-scale, the interests of the shareholders were identified with those of the consumers; and it was in the interest of the Company, no less than in that of the consumer, that the price should be kept down.

The report was received.

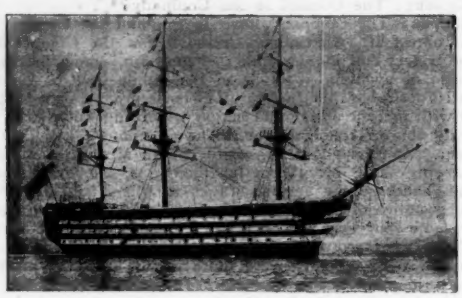
Birmingham Gas Department.

The Birmingham Gas Committee in a report to the City Council refer to the subject of gas supplies to small house property in courts and terraces. Considerable progress had been made in the lighting of courts and passages themselves, and in the provision of slot meter installations, though there were still many courts, particularly in the poorer parts of the city, which had no gas supply. There was less reluctance on the part of landlords to pay the cost of "carcassing" a house with internal piping, which costs, on an average, about 45s. per house. In 1922, 370 such houses were dealt with; in 1923, 535; and in 1924, 1155. Housing developments were sufficient to keep all the available gasfitters fully employed, and the Gas Committee considered it would be unwise to contribute further towards the cost of installing gas in existing small house property. The present practice is for the Department, at their own expense, to lay the main supply pipe from the street, after a house has been "carcassed;" and a concession is also made in the cost of the service pipe therefrom to the meter—only a nominal sum of 2s. 6d. per house being charged against the property owner. By arrangement, however, the cost of installations to property owners may be spread on the instalment principle over a period not exceeding five years. Branch depôts and offices are to be opened at Acocks Green and Erdington, and at each a number of gasfitters and one or two clerks will be stationed. A recommendation is made by the Gas Committee in favour of the purchase of six small Wolseley two-seater motor cars for the use of mains inspectors.

Wells Gas Light Company.—Messrs. A. & W. Richards have been instructed by the Directors of the Company to offer for sale by tender £8000 6½ p.ct. irredeemable preference stock; the minimum price being par. It will have been seen from the announcement appearing in our advertisement pages that tenders should be forwarded to Messrs. Richards, No. 37, Walbrook, E.C. 4, not later than eleven o'clock on Tuesday, April 21.

Bridgwater Gas Light Company.—When reporting the results for the year 1924, the Directors were able to point to an increase of about 2¾ million c.ft. in the sales of gas, and to a further reduction to 11·11d. per therm (or 4s. 2d. per 1000 c.ft), which is less than 40 p.ct. above the pre-war charge. At the meeting, the Chairman (Mr. R. Y. Foley) remarked that the results were again very satisfactory; over 15,100 c.ft. of gas being made per ton of coal carbonized. Mr. Cornish, Jun., has been appointed Works Manager; while Mr. J. H. Cornish continues to render valuable service to the Company as Manager and Secretary.

Torquay and Paignton Gas Company.—Presiding at the annual general meeting of the Company, Major R. P. Kitson (Chairman of Directors) said the revenue account fully justified the amalgamation between the Torquay and Paignton Companies. The sales of gas had increased wonderfully—the total increase for the year being 31 million c.ft. No fewer than 369 millions had been sold. The necessary plant for effecting and carrying on the entire manufacture of gas at the Hollacombe Works would be in complete operation before the next annual meeting. The increased demand for gas showed every sign of continuing, as the district was rapidly developing in all directions. With regard to residuals, it was satisfactory to note that the sales under this heading had realized 64 p.ct. of the cost of coal. Continued progress was also recorded in the sale of fittings. The shareholders and the public would shortly receive notice of the intention to issue for sale by tender debenture stock in the Company. The accounts, which showed a disposable balance of £21,688, were passed, together with a dividend at the rate of 6 p.ct. per annum upon the ordinary stock, less income-tax.



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NORTH-EAST COAST COAL TRADE.

From our Own Correspondent.

There is an entirely featureless market, with holiday conditions and continued absence of forward inquiry.

Wear Special makes indicate 20s. f.o.b., and best qualities 19s. 6d. to 20s. Seconds and others are 17s. to 17s. 3d

YORKSHIRE AND LANCASHIRE COAL TRADE.

From our Local Correspondent.

The situation in the coal trade in Yorkshire and Lancashire remains practically unaltered from that of last week. Gas coals are moving steadily under contract. Prices are also about the same. For prompt account, best hards have been sold at 19s. 3d. to 19s. 6d per ton f.o.b., and secondary sorts showed little recovery from the depression. There is no improvement in the export sections, Continental competition remaining keen. Washed doubles are quoted at about 17s. to 17s. 6d. per ton f.o.b., and singles about 17s. 6d. The home inquiry for all kinds of industrial fuel remains small.

COAL TRADE IN THE MIDLANDS.

From our Local Correspondent.

A very gloomy view is taken of the outlook in the Midland coalfields, on account both of the immediate effects of a shrunken turnover and the large implications of the crisis in an economic sense. It is feared it must prove disastrous for many of the less favourably situated undertakings, and seriously aggravate unemployment. A decision has been taken to close the Great Wyrley Colliery—till recent years one of the most prosperous mining properties on Cannock Chase. The pitmen to the number of about 640 have received notice to terminate their engagements this week. Future policy is being anxiously considered by a great many managements, since it is evident that unless demand expands, of which there is little expectation at present, collieries which are relatively expensive to work, and which have no sufficient non-competitive distributive radius, cannot hope to hold their own against big concerns with rich deposits worked with all the labour-saving resources of modern equipment.

The market for gas coal is stagnant and featureless. Steams and all qualities of industrial fuel are in abundant supply. The trade has been very inactive during the past fortnight. Very little coal is being raised this week. With considerable stocks in hand, the resumption will be irregular. Market values are very unstable.

CONTRACTS OPEN.

Coal.

The Directors of the Otley Gas Company are inviting tenders for the supply of 5000 to 7000 tons of best screened gas coal or nuts. [See advert. on p. 194.]

EXTENSIONS.

New Retorts for Oswaldtwistle.

The Oswaldtwistle Gas Committee are applying to the Ministry of Health for sanction to borrow £21,000 for new retorts.

Light and a Shopping Week.—At a special meeting of all traders interested in a shopping week proposal at Bradford, held under the auspices of the Bradford Chamber of Trade, Mr. S. H. Packer, Sales Manager to the Bradford Corporation Gas Department, strongly supported the proposal, and said his Department would help in every way possible. He suggested that the period should be a fortnight, instead of a week; and in this proposal he was supported by several other speakers. At the same meeting Mr. C. E. Allsopp, Sales Manager to the Bradford Electricity Department, said he believed traders for that period would be allowed electricity for lighting at 1½d. per unit (the present price charged for window lighting after shop hours), instead of the normal price of 7d. per unit.

Illuminated Signs Association.—An Association of Users and Manufacturers of, and Traders in, Illuminated Signs has been formed, with offices at No. 25, Victoria Street, Westminster, "to watch the proceedings of Parliament and Government Departments for the purpose of protecting the interests of its members against restrictive legislation; to safeguard those interests against excessive rating and prohibitive by-laws proposed by local authorities; and to take action in matters of a legal character in which its members may be involved within the functions of the Association." The Association is opposing the action of a municipal authority in seeking powers to prohibit the use of illuminated signs, since, if these powers are obtained by one Corporation, other local bodies will make similar applications, with the result that the industry will be completely crippled, and a valuable advertising medium lost.

Devon Gas Association.—The 10th annual meeting of the Association was held on April 2, at Exeter. The Chairman (Mr. F. T. Depree, J.P.), in moving the adoption of the report, said that during the year the price of gas had been generally reduced, but the increase in output had more than made up for this. The Moretonhampstead Works had recently been much improved by the addition of new storage accommodation and carbonizing plant, while the freehold of the site had been acquired. Perhaps the most important event of the year was the acquisition of the Ivybridge gas undertaking. This was situated in a thriving district, and he looked forward to its becoming a valuable addition to the Association. The decrease in the value of all gas-works residuals was a matter of some concern in the coming year; but he hoped that it would not be necessary to increase the price of gas. Mr. R. J. Rew, seconding, referred to the structural improvements and additions to the various plants at their several works. The report was adopted, and a 7½ p.ct. dividend, less income-tax, was declared.

CURRENT SALES OF GAS PRODUCTS.

The London Market for Tar, Tar Products, and Sulphate.

London, *April* 13.

Business in the London tar products market is very quiet at present, which is to be expected during the holiday week. Prices are unchanged.

Tar Products in the Provinces.

April 14.

Markets generally remain dull, and there is nothing of interest to report.

Pitch is still neglected. Some business has been done on the Continent on the basis of 40s. f.o.b. U.K. ports; while South Wales have refused offers at equal to 35s. f.a.s. Manchester. The present low price makes forward business impossible. Consumers refuse to pay any advance on prompt prices; while makers, quite naturally, feel they can do no harm by waiting.

Creosote is quiet, but the undertone is steady; and it is confidently expected that before long export orders for July-December will come into the market.

Benzoles are steady, solvent naphtha firm, carbolic and cresylic dull, and naphthalene and anthracene almost unsaleable.

The average values for gas-works products during last week were: Gas-works coal tar, 28s. 6d. to 33s. 6d. Pitch, East Coast, 40s. to 41s. f.o.b. West Coast—Manchester, 35s. to 36s.; Liverpool, 36s. to 37s.; Clyde, 39s. to 40s. Benzole, 90 p.ct., North, 1s. 6½d. to 1s. 7½d.; crude, 65 p.ct., at 120° C., 7½d. to 8½d., naked at makers' works; 50-90 p.ct., naked, North, 1s. 6½d. to 1s. 7½d. Toluole, naked, North, 1s. 6d. to 1s. 7d., nominal. Coal-tar crude naphtha, in bulk, North, 7½d. to 8½d. Solvent naphtha, naked, North, 1s. 5d. to 1s. 6d. Heavy naphtha, North, 1s. to 1s. 2d. Creosote, in bulk, North, liquid, 6½d. to 6⅝d.; salty, 6d. to 6¼d.; Scotland, 5⅞d. to 6¼d. Heavy oils, in bulk, North, 6¼d. to 7d. Carbolic acid, 1s. 5d. to 1s 6d. prompt. Naphthalene, £11 to £14; salts, £4 to £5, bags included. Anthracene, "A" quality 2½d. per minimum 40 p.ct., purely nominal; "B" unsaleable.

Social Side of Messrs. W. J. Jenkins & Co., Ltd., Retford.

Much has been written on the primary duty of employers in every industry to diffuse the proper atmosphere of sociability and goodwill around their managerial staff and employees, and quite a lot of valuable data have been compiled from large concerns where this atmosphere has been created. Fortunately it requires little search to recognize the chief factors which go so far towards completing this most desirable unity. Three of them are undoubtedly the spirits of recreation, sport, and harmony. The times demand that work and play shall run hand in hand; and the really modern employer—keen psychological student that he usually is—fully recognizes this combination, and gives the matter his wholehearted support. An example of this was recently to be found in the Town Hall, Retford, when a delightful evening was spent under the auspices of the Beehive Works Sports Club of Messrs. W. J. Jenkins & Co., Ltd. Nearly 800 were present at the entertainment, which was of an unusually high order, and was provided by the members of the Social Section in the form of an original revue entitled "The Belles of Honolulu" or "The Blue Lagoon." This revue was specially written and produced by a talented member of the staff, who was also responsible for the painting of the beautiful scenery, kindly presented by the management. The artistes were mainly drawn from the various departments and workshops of the firm. The consensus of opinion was that it was one of the most brilliant and inspiring shows ever put on the local platform. After the revue, there was dancing.

Increased Consumption at Oldbury.—At a meeting of the Oldbury District Council last week, Mr. K. H. Wilson (the Chairman of the Gas Committee) referred to the fact that during the year ended March 31 210 million c.ft. of gas had been consumed, compared with 191 million c.ft. in the previous year—an increase of over 10 p.ct.

Australian Gas Light Company.—It has been decided by the Directors to dispense with the printing of a half-yearly balance-sheet and report, and to substitute for them an annual balance-sheet and report for the Company's year ending June 30, for presentation at the statutory annual meeting to be held in August. A dividend of 4 p.ct. for the past six months was declared, leaving a balance to be carried forward of £50,530.

Prepayment Consumers at Glasgow.—Councillor Hanlon has given the Glasgow Corporation Gas Committee notice that, at the next meeting, he will move: "That it be remitted to a Special Sub-Committee to consider and report as to the advisability of increasing the number of prepayment meters already in use, or alternatively considering some means of restoring the supply to householders who have had the supply cut off through inability to pay their gas accounts."

Reduction in Price at Neath.—The Neath Town Council, at their last meeting, adopted a recommendation of the Gas Committee to reduce the price of gas, as from the March quarter readings, by 1d. per therm (equivalent to 4½d. per 1000 c.ft.). This reduction follows upon one of 2·1d. per therm (equivalent to 8·925d. per 1000 c.ft.) which came into operation as from the March quarter readings, 1924. During the past year, the Neath Gas Department have closed down the Briton Ferry Works, which were taken over at the time of the Neath borough extension; and the whole of the gas for the extended area is now being supplied from the Neath Works. These works have been considerably remodelled and extended during the past three years; and the economies effected are now showing in the reduced price for gas. A Sports and Recreation Club has recently been organized; and the work of laying down a bowling green, tennis court, &c., on the spare land adjoining the gas-works is being proceeded with. A recreation room, including mess room, bath room, &c., was formally opened by the Mayor about three weeks ago.

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No. 654d "Esto" Gas Cooker.

STOCK MARKET REPORT.

The only redeeming feature on the Stock Exchange last week was the success of the new issues. The principal of these was the Municipality of Danzig loan for £1,500,000, which was considerably over-subscribed. A premium of 1¾ was quoted at first, but the efforts of the "stags" to unload before the holidays brought this down rapidly to ¾ premium. There were several other issues, including the London County Freehold and Leasehold Debentures and the Burndept Wireless Preferred shares, all of which, being regarded as fairly good purchases, were successfully floated. Otherwise, with perhaps the exception of the usual popular shares, there was a total lack of business; the public, intent on holidays, giving little attention to stocks and shares.

The outlook is still dominated by the position in France, which is very uncertain, and it is not relieved by the announcement at the weekend of the Premier's resignation, the effect of which will doubtless be noticeable when the markets reopen. It is feared the news will accentuate the present depression, especially on the Foreign Market.

In the Gas Market there was no exception to the general rule, although there were fewer changes in the quotations. Gas Light ordinary fell another 1½ points to 86-89. The announcement of the Company's intention to raise the price of gas as from June next, bringing in its train a reduction in the authorized dividend, will not tend to improve the price. It must be remembered, however, that a reduction of dividend is not compulsory until February of next year, when, subject to the price of gas not having been still further increased, the authorized rate payable will be £4 17s. 4d. p.ct. per annum, which is the same rate that was paid immediately pre-war.

The Commercial Gas stocks are now quoted at 88-91 and 87-90 for the 4 p.ct. and 3½ p.ct. stocks respectively. The authorized dividends on these stocks payable in August next are £5 6s. 8d. and £5 3s. 4d. p.ct. per annum, which rates are slightly less than the pre-war dividends.

The following transactions were recorded during the week:

On Monday, Aldershot "C" 78½, 4 p.ct. preference 72½, Commercial 3½ p.ct. 87, Continental Union 7 p.ct. preference 90½, East Hull (5 p.ct. max.) 86½, 86⅝, Gas Light and Coke 88½, 88⅝, 88¾, 89, 89¼, 4 p.ct. preference 78¾, 79½, 3 p.ct. debenture 60, 61, Imperial Continental 180, 181, Primitiva 8s. 6d., 8s. 9d., 8s. 10½d., 8s. 11¼d., 4 p.ct. debenture (1911) 63½, South Metropolitan 94½, 95¼, Tottenham "A" 118¾, "B" 98, 99. Supplementary prices, Brentford 6 p.ct. mortgages 100.

On Tuesday, Aldershot "C" 78¼, 79½, Alliance and Dublin 66½ *ex* div., Brighton and Hove 169, 170, Bristol (5 p.ct. max.) 93½, British 112, Commercial 4 p.ct. 88, 3½ p.ct. 87, 3 p.ct. debenture 58⅞, 60, Continental Union 37, European 7¾, Gas Light and Coke 88½, 88¼, 88⅞, 89¼, 89¾, 3½ p.ct. maximum 63, 63½, 63⅝, 3 p.ct. debenture 60, 60½, 60⅞, 61, Imperial Continental 179½, Primitiva 8s. 6d., 8s. 7½d., South Metropolitan 94¼, 95¼, 6½ p.ct. debenture 103, South Suburban 5 p.ct. 98, 101½. Supplementary prices, Dover 5¼ p.ct. debenture 102¼, 102½, Hartlepool 5 p.ct. maximum 89⅜, Wandsworth 3½ p.ct. new 95.

On Wednesday, Aldershot "C" 79½, Bombay 5½, £5 3s., Commercial 4 p.ct. 87, 3½ p.ct. 87, European 7¼, Gas Light and Coke 88⅜, 88½, 88⅜, 89, 89¼, 4 p.ct. preference 78½, 79¾, Imperial Continental 179, 180, Primitiva 4 p.ct. debenture (1911) 64½, South Metropolitan 94¼, 3 p.ct. debenture 60½, 61¼. Supplementary prices, Dover 5¼ p.ct. debenture 102¼, 102½, North Middlesex 5 p.ct. preference 90½, 91.

On Thursday, Bombay 5¼, Bournemouth "B" 12⅜, Continental Union 36½, Gas Light and Coke 87, 87¼, 88, 88⅛, 88½, Imperial Continental 180½, 182, 182½, Montevideo 65⅜, Primitiva 4 p.ct. debenture 64, 65, South Metropolitan 95, 95¼, Wandsworth "B" 113½, 114. Supplementary prices, Liverpool 5 p.ct. 87½, Newport (Mon.) 5 p.ct. maximum 84, Wandsworth 5 p.ct. preference 95.

The Money Market also bore signs of the holiday atmosphere, and rates were quiescent. Discount quotations were possibly easier, due doubtless to the low rate at which Treasury Bills were allotted. The average rate was £4 3s. 4·18d. p.ct., or 2s. 3d. below that for the previous week. The new Treasury Bills were dealt in at 4⅛ p.ct. Money was fairly plentiful on Thursday, and rates for fresh accommodation declined to 3 p.ct., but rather tighter conditions prevailed on Saturday.

In the Foreign Exchange Market on Thursday the Paris cheque moved against France, rising at one time to 93.40; but on Saturday, in spite of the political disturbances, the rate improved to 92.45 to the £. Belgian francs moved in sympathy to 94.45. Sterling on New York was weaker at 4.76⅜ dollars, and Italian lire rather cheaper to 116.40.

The Silver Market was quiet, the price for cash being 31½d. per oz. Gold was 1d. down on the week at 86s. 5d. per oz.

The Bank Rate is 5 p.ct., to which it was raised from 4 p.ct. on March 5. Bankers' deposit rates are 3 p.ct. The deposit rates of the discount houses are 3 p.ct. at call and 3¼ p.ct. at notice.

Issue.	Share.	When ex-Dividend.	Dividends. Prev. Hf.Yr.	Dividends. Last Hf. Yr.	NAME.	Quotations. Apl. 9.	Rise + or Fall − on Week.	Transactions Lowest and Highest Prices.
£			%p.a.	%p.a.				
171,978	Stk.	Feb. 5	5	5	Aldershot 5 p.c. max. C.	78–81	..	78½–79½
295,492	,,	,,	4	4	Do. 4 p.c. Pref.	71–76	..	72½
2,351,868	,,	Apl. 2	6½	6½	Alliance & Dublin Ord.	66–71	+1	66½
374,000	,,	Jan. 8	4	4	Do. 4 p.c. Deb.	63–68	..	..
300,000	£5	Oct. 23	8	8	Bombay, Ltd.	⅝–5⅛	..	5⅛–5⅛
100,000	10	Mar. 5	8½	8½	Bournemouth 5 p.c.	12–13	..	..
425,050	10	,,	7	7	Do. B 7 p.c.	12½–12⅝	..	12⅝
150,000	10	,,	6	6	Do. Pref. 6 p.c.	11–12	+⅛	..
50,000	Stk.	Jan. 8	3	3	Do. 3 p.c. Deb.	56–59	..	..
162,025	,,	,,	4	4	Do. 4 p.c. Deb.	76–79	..	..
992,045	,,	Mar. 5	6 3/10	6 3/10	Brentford A Con.	100–103	..	..
990,500	,,	,,	6½	6½	Do. B New	100–105	..	..
76,000	,,	,,	5	5	Do. 5 p.c. Pref.	95–98	..	..
306,690	,,	Dec. 18	4	4	Do. 4 p.c. Deb.	76–81	..	..
181,337	,,	,,	6	6	Do. 6 p.c. Rich. Red. Deb.	100–105	..	..
214,740	,,	Mar. 5	11½	12½	Brighton & Hove Orig.	165–170	..	169–170
244,200	,,	,,	8½	9½	Do. A Ord.	122–125	..	..
1,287,500	,,	Feb. 19	5	5	Bristol 5 p.c. max.	96½–97½*a*	..	93½
855,000	,,	Mar. 19	8	7	British Ord.	112–117*	..	112
100,000	,,	Dec. 18	7	7	Do. 7 p.c. Pref.	123–128	..	..
120,000	,,	,,	4	4	Do. 4 p.c. Red. Deb.	72–77	..	..
100,000	10	Dec. 18	8	6	Cape Town, Ltd.	7–8	..	..
100,000	10	Nov. 6	4½	4½	Do. 4½ p.c. Pref.	6–7	..	..
150,000	Stk.	Dec. 18	4½	4½	Do. 4½ p.c. Deb.	71–76	..	..
626,860	,,	Feb. 19	6	6	Cardiff Con. Ord.	101–104	..	..
237,860	,,	Jan. 8	7½	7½	Do. 7½ p.c. Red. Deb.	104–107	..	..
157,150	,,	Feb. 19	5	6½	Chester 5 p.c. Ord.	89½–94½*b*	..	..
1,513,280	,,	Mar. 5	6	5/14/8	Commercial 4 p.c. Cap.	88–91	−2	87–88
560,000	,,	,,	6	5⅜	Do. 3½ p.c. Cap.	87–90	−2	87
475,000	,,	Dec. 18	3	3	Do. 3 p.c. Deb.	57–60	..	58⅞–60
800,000	,,	14 Jan. 15	—	—	Continental Union, Ltd.	37–42	..	36½–37
200,000	,,	Dec. 18	7	7	Do. 7 p.c. Pref.	88–92	..	90½
660,000	,,	Mar. 5	6½	6½	Croydon sliding scale	100–103	..	..
284,975	,,	,,	5	5	Do. max. div.	83–86	..	..
492,270	,,	Feb. 19	6	9	Derby Con.	110–112*c*	..	..
55,000	,,	Jan. 8	4	4	Do. Deb.	74–76*c*	..	..
1,002,180	1	Jan. 22	6	4	European, Ltd.	7–8	..	7½–7¾
16,460,070	Stk	Feb. 19	5⅛	5⅛	Gas Light & Coke 4 p.c. Ord.	86–89	−1½	87–89½
2,600,000	,,	,,	3½	3½	Do. 3½ p.c. max.	62–65	..	63–63½
4,062,235	,,	,,	4	4	Do. 4 p.c. Con. Pref.	78–80	..	78½–79½
4,761,930	,,	Dec. 18	3	3	Do. 3 p.c. Con. Deb.	59–62	..	60–61
130,000	,,	—	10	10	Do. 10 p.c. Bonds	..	..	..
42,000	,,	—	7½	7½	Do. 7½ p.c. Ilford Deb.	..	..	..
82,500	,,	Mar. 19	6½	6½	Hastings & St. L. 5 p.c. Conv.	92–97*	..	..
258,740	,,	,,	5½	5½	Do. 3½ p.c. Conv.	73–78*	..	..
70,000	10	Sept. 25	10	10	Hongkong & China, Ltd.	16–17	..	..
86,600	Stk.	Mar. 5	10	10	Hornsey 7 p.c.	138–143	..	..
1,976,000	,,	Nov. 20	30	10	Imperial Continental Cap.	179–184	..	179–182½
263,950	,,	Feb. 5	3½	3½	Do. 3½ p.c. Red. Deb.	71–74	..	..
235,242	,,	Mar. 19	6½	6½	Lea Bridge 5 p.c. Ord.	96–101*	..	..
2,127,340	,,	Feb. 19	5½	5½	Liverpool 5 p.c. Ord.	87½–88½*b*	..	87½
600,000	,,	Mar. 19	7	7	Do. 7 p.c. Red. Pref.	102–103*b*	..	..
165,736	,,	Feb. 19	9	8	Maidstone 5 p.c. Cap.	122–132	..	..
63,480	,,	Dec. 18	3	3	Do. 3 p.c. Deb.	54–59	..	..
75,000	£5	Dec. 4	7	5	Malta & Mediterranean	4–4½	..	..
541,920	Stk.	Nov. 20	4	4	Montevideo, Ltd.	62–67	..	65⅜
2,061,315	,,	Mar. 5	5	5	Newcastle & Gateshead Con.	80–81*d*	..	..
300,929	,,	,,	4	4	Do. 4 p.c. Pref.	72½–73½*d*	..	..
529,705	,,	Dec. 18	3½	3½	Do. 3½ p.c. Deb.	68–69*d*	..	..
15,000	10	Mar. 5	11	12	North Middlesex 10 p.c.	..	..	..
75,940	10	,,	7 7/10	8⅜	Do. 7 p.c.	..	..	..
300,000	Stk.	Dec. 4	7	9	Oriental, Ltd.	102–107	..	..
188,120	,,	Jan. 8	7⅛	7½	Plym'th & Ston'house 5 p.c.	109–114	..	..
60,000	50	Mar. 5	13	14	Portsea Island B	96–99	..	..
100,000	50	,,	12	13	Do. C	93–98	..	..
2,289,909	1	—	—	—	Primitiva Ord.	8/3–9/3	..	8/6–8/11½
311,100	100	Dec. 1	4	4	Do. 4 p.c. Red. Deb.	79–81	..	..
600,000	Stk.	Jan. 22	4	4	Do. 4 p.c. Red. Deb. 1911	63–65	..	64–65
220,335	,,	Dec. 18	4	4	Do. B. Aires 4 p.c. Rd. Db.	65–67	..	..
321,670	,,	,,	4	4	Do. R'r P'te 4 p.c. Rd. Db.	65–67	..	..
150,000	10	Mar. 19	6	6	San Paulo 6 p.c. Pref.	7⅞–8⅛	..	..
125,000	50	Jan. 2	5	5	Do. 5 p.c. Red. Deb.	43–46	..	..
270,000	Stk.	Mar. 19	5½	5½	Sheffield A	102–104*e*	..	..
419,968	,,	,,	5½	5½	Do. B	102–104*e*	..	..
1,047,000	,,	,,	5½	5½	Do. C	102–104*e*	..	..
90,000	10	Oct. 23	8	6	South African	7–9	..	..
6,609,895	Stk.	Feb 19	5	6½	South Met. Ord.	94–95	..	94⅛–95⅛
1,895,445	,,	Jan. 8	3	3	Do. 3 p.c. Deb.	59–62	..	60½–61½
734,000	,,	Mar. 5	6½	6½	Do. 6½ p.c. Red. Deb.	102½–104½	..	103
91,500	,,	Mar. 5	8½	8½	South Shields Con.	135–136*d*	..	..
1,187,795	,,	Feb. 19	6½	6½	South Suburban Ord. 5 p.c.	98–103	−1	98–101½
368,837	,,	Dec. 18	5	5	Do. 5 p.c. Deb.	97–100	..	..
647,740	,,	Nov. 6	3	3	South'mpt'n Ord. 5 p.c. max.	83–86	..	..
121,275	,,	Dec. 18	4	4	Do. 4 p.c. Deb.	72–77	..	..
250,000	,,	Mar. 5	7	7	Swansea 7 p.c. Red. Pref.	101–103	..	..
200,000	,,	Dec. 18	6½	6½	Do. 6½ p.c. Red. Deb.	103–105	..	..
120,000	,,	Feb. 19	8	8	Tottenham District A 5 p.c.	116–119	..	118½
882,375	,,	,,	6½	6½	Do. B 3½ p.c.	98–101	..	98–99
181,255	,,	Dec. 18	4	4	Do. 4 p.c. Deb.	75–79	..	..
258,251	,,	Mar. 19	5	5	Tynemouth Con. and New	77–79*d*	..	..
					Uxbridge, Maidenhead, &			
197,294	,,	Feb. 19	6½	6½	Wycombe 5 p.c.	100–105	..	..
88,330	,,	,,	5	5	Do. 5 p.c. pref.	93–98	..	..
91,800	,,	,,	—	6½	Do. 5 p.c. Maidenh'd	90–95	..	..
					Wandsworth, Wimbledon,			
					and Epsom—			
30,000	,,	Mar. 5	9½	9½	Wandsworth A 5 p.c.	135–140	..	..
255,636	,,	,,	7½	7½	Do. B 3½ p.c.	113–118	−1	113½–114
392,955	,,	,,	6/9/6	6/9/6	Do. C and New	97–102	..	95
352,000	,,	,,	7⅜	7½	Wimbledon 5 p.c.	109–114	..	..
98,000	,,	,,	7½	7½	Epsom 5 p.c.	117–122	..	..
88,416	,,	Dec. 18	3	3	3 p.c. Deb.	57–60	..	..

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By

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Infringing the Municipal Corporations Act.—Mr. S W. B. Stephen, the Chairman of the Gas Committee of the Smethwick Town Council, who was recently disqualified through having dealings in coke with the Gas Department, has again been elected to the Town Council.

Leamington Priors Gas Company.—Presiding at the annual meeting of the Company, Dr. Harold Mason expressed the opinion that the reduction in the price of gas, bringing it down to 8¾d. per therm, had been justified. This was shown by an increase of 3½ million c.ft. in gas sales. They were recommending the payment of the usual dividends, but they had had to reduce their carry-forward.

An Address on Gas Undertakings.—At a recent meeting of the Dudley Rotary Club, Mr. G. E. Ashurst, Secretary of the Dudley Gaslight Company, read a paper on "The Distinctive Features of Statutory Undertakings, with special reference to Gas Undertakings." Mr. Ashurst, in the course of his remarks, referred to the popularity of gas for public street lighting, mentioning that a census of 1000 cities and towns in the United Kingdom resulted as follows: Out of 670,300 lamps, 585,600 were gas—or 87 p.ct.

Tavistock Lighting, Coal, and Coke Company, Ltd.—At the annual meeting of the Company—Mr. T. Doidge presiding—the report of the Directors stated that the output of gas had increased, and that the sales were 9 p.ct. above those for 1923. Residuals also had yielded a satisfactory return. The mains in various parts of the town had been enlarged to meet the increasing requirements. The balance at the credit of the profit and loss account, after providing for income-tax and the payment of an interim dividend, was £1081. The report and statement of accounts were adopted. It was resolved that a final dividend be declared at the rate of 4 p.ct. (less income-tax) for the half-year ended Dec. 31, 1924, on the original capital, and £2 16s. p.ct. on the additional capital.

Limerick Gas-Works Improvements.—The Free State Ministry of Industry and Commerce have informed the Limerick Corporation, in relation to the latter's application for a loan of £30,000 for carrying-out improvements in the city gas concern, that the men displaced by the introduction of new machinery will have their claims for compensation favourably entertained by the Ministry, and that it is the intention of the Local Government Ministry to introduce legislation empowering local authorities to make provision for granting pensions to employees in the gas and other sections. The Corporation Law Adviser reported on his interview with the Minister in regard to the men who would be unemployed through the gas-works improvements, and said they would receive gratuities and pensions. This was considered satisfactory.

Lighting at Northampton.—At a recent meeting of the Northampton Corporation Highways Committee, the Borough Engineer submitted communications from the Northampton Gaslight Company on the question of street lighting. The Company pointed out that at present 1304 public street lamps were lighted, and the annual costs (£6044) were proportionately high as compared with the cost of lighting the whole of the lamps in the borough—viz., 1764. The cost of lighting the 1764 lamps would be £7757; but in the event of such lamps being lighted, the Company were prepared to reduce the annual charge to £7150. They also suggested that a new contract for a period of seven years (instead of five, as at present) should be entered into. The Committee resolved that a contract in accordance with the terms set out above should be made.

Further Capital for the Barnet Company.—The Directors of the Barnet District Gas and Water Company are inviting tenders for £15,000 of "D" capital gas stock, ranking equally with the existing similar capital now receiving the maximum dividend of 7 p.ct. per annum. The minimum price of issue is £110 per £100. Tenders must be received by the Secretary of the Company, at No. 139, Cannon Street, E.C., not later than Monday morning, April 20.

Gas Light and Coke Company's Price Increase.—The Directors of the Gas Light and Coke Company regret to have to announce that the price of gas throughout the Company's district will be increased from 8·6d. per therm (3s. 7d. per 1000 c.ft.) to 9·4d. per therm (3s. 11d. per 1000 c.ft.), as from the date of recording the meter indices for the June quarter. This advance in the price of gas will necessitate a reduction in the Company's dividend. The price of the Company's gas was steadily reduced from the end of 1921 till June, 1923, when it reached its present low figure; and an increase in the price is now rendered necessary by the serious reduction in the revenue derived from coke and other residual products, and by the increase in wages paid since the beginning of the present year. The consumers are assured that the price is not being raised more than is absolutely necessary, and that it will be reduced at the earliest possible moment.

Steam Raising Problems.—On Monday evening, March 30, Mr. A. Whatmore, A.M.I.M.E. (Works Manager of Messrs. Parkinson and W. & B. Cowan, Ltd., Victory Works, Manchester), gave a lecture before the North-Western Section of the Junior Institution of Engineers, on "Steam Raising Problems." He discussed various forms of firing, including gas firing, and mentioned, in making a forecast of the future, that the day would come when there would be super-gas stations, in a similar manner to the super-electricity stations now being built. This would allow of all coal being gasified, the bye-products sold, and gas supplied to manufacturers for steam raising, and also the supplying of gas to super-power stations either for firing the boilers to produce the steam for turbines or for gas engines. This would result in considerable economy in regard to production, and also eliminate to a certain extent the smoke problem. A good discussion followed the lecture.

The Directors of the Abergele and District Gas Company have decided to reduce the price of gas at an early date by 7d. per 1000 c.ft.

To bring home to local allotment holders and others the use of sulphate of ammonia as a fertilizer, the Burnley Gas Department are making a demonstration in their showroom. The display is arousing much interest.

Alderman Aspinall, speaking on the occasion of "budget day" in the Bolton Town Council, said it was gratifying to note that the gas undertaking was likely to finish the financial year considerably better than was anticipated twelve months ago.

At a meeting of the Blackpool Town Council, on April 1, Alderman Broadhead said they had £10,872 to the credit of reserve on the gas undertaking. This he regarded as insufficient, and for this reason it was proposed to place the whole of last year's profits, and unappropriated balance for the previous year, to the improvement of this reserve. He said that there had been considerable development in the gas undertaking; the consumers having increased from 21,280 to 22,606—equivalent to 6 p.ct.

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